



BENCHMARKS

The University of North Texas Computing Center Newsletter

VOLUME 13 NUMBER 4

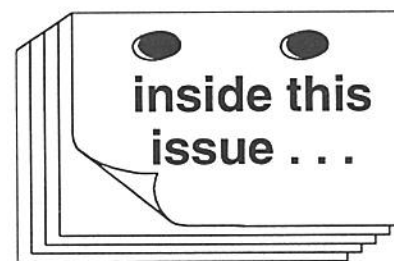
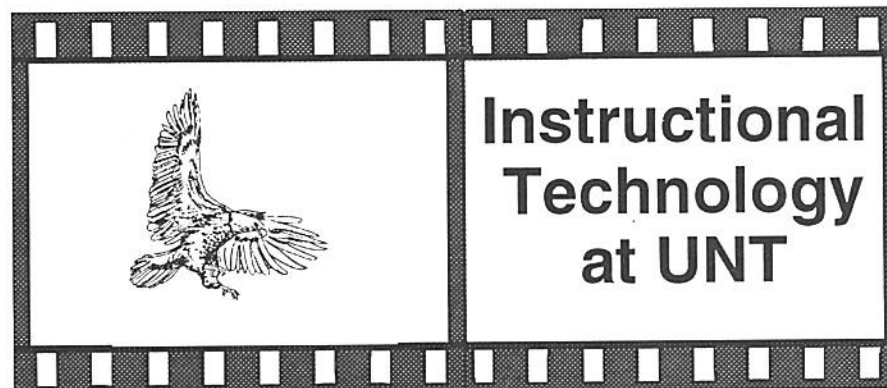
May 1992

Enhancing the Educational Process at UNT

By Dr. Philip Baczewski, Acting Director of Academic Computing (BITNET: AC12@UNTVM1) and Claudia Lynch, *Benchmarks* Editor (BITNET: AS04@UNTVM1)

We are fortunate to have a wide variety of computing and information technologies available at the University of North Texas and we successfully instruct students in the use of these technologies. Some very strong programs exist in Applied Sciences, Business Computer Information Systems, Computer Music, Computer Sciences, Engineering Technology, and other areas. However, a survey of UNT faculty conducted by the Office of University Planning in November 1991, indicated that the use of an overhead projector in the classroom and the use of a computer to prepare for class were far and away the most frequently used technologies in support of instruction, and these technologies were used on a regular basis by only about 50% of those responding. Thus, while UNT is excelling in the instruction of technology, on the surface we seem to be far behind in the use of technology to enhance the instruction process itself. However, a closer examination of some academic departments on campus shows that information and media technology is enhancing the instruction process in ways which would not be immediately evident from a casual inspection.

This issue of *Benchmarks* is devoted to exploring the employment of instructional technology on the UNT campus. Our last issue presented some background material on instructional technology, highlighting new developments in bringing multimedia to the desktop. By highlighting what is already happening at UNT, we hope to encourage contemplation of the application of available technologies and development of new technology-based materials to enhance the learning process for UNT students.



□ INSTRUCTIONAL TECHNOLOGY	
CECS: Teaching at UNT.....	3
TCET.....	4
TCET Project in Line for Award ...	6
Professional Development Centers..	6
CECS Hosts Conference.....	7
SLIS: Computer Technology	8
SLIS Overview	8
BCIS: The Electronic Connection ...	9
IAS: Computing & Instruction.....	10
Mathematics and Technology.....	10
Technologically Speaking.....	11
CAI in EADP	12
Computers and Music	13
□ GENERAL INFORMATION	
UNT Metro Line Problems	14
Local 2400 Baud Modems	15
Semester Break Lab Hours.....	15
IRC News	16
Administrative User-ID Issues.....	18
Going Somewhere? Read This.....	19
The Network Connection	19
List of the Month.....	20
IMSL Manuals	21
<i>Benchmarks</i> Forum.....	21
Staff Activities	21
Calls for Papers	22
□ MICROCOMPUTERS	
MICRO-TIPS	23
Virus Update	23
□ VAX/UNIX SYSTEMS	
VAXCLUSTER Usage Statistics	24
The UNIX Shell	24
Solbourne Usage Statistics	25
VAX/UNIX News	27
□ MAINFRAME TECHNICAL SERVICES	28
Performance Statistics	29
□ CLIP TIP	31

☆ UNT COMPUTING CENTER ORGANIZATION AND FACILITIES ☆

The UNT Computing Center is located in the Information Sciences Building (ISB), Room 119. Phone: (817) 565-2324 (TDD 1-800-RELAY-TX), unless otherwise noted. It is divided into the following areas:

☐ **Academic Computing Services:**

- Documentation Services
- ISB 110 General Access Lab (817) 565-3048
- Mainframe User Services
- Statistical Services
- VAX/UNIX Systems (817) 565-4161

☐ **Network & Microcomputer Services (817) 565-2316:**

- Data Communications
- Microcomputer Application Support
- Network Systems Support

☐ **Administrative Computing:**

- Admissions Data Systems
- Database/Central Programming Support
- General Data Systems
- NT/TCOM Fiscal Data Systems
- NT/TCOM Payroll/Personnel
- Student Records
- Student Services
- Voice Response Applications

☐ **Mainframe Technical Services:**

- IBM Operating Systems Software Support
- Computer Operations
- Production Services



CONNECTING TO UNT COMPUTERS



Phone numbers for accessing UNT computing systems:

300-2400 BAUD: (817) 565-3300

300/1200 BAUD: (817) 565-3499

300-9600 BAUD: (817) 565-3461

300-2400 BAUD: D/FW METRO 792-4140

Area code 214 must dial 817 before the METRO #.

Set Data Bits to 7, Parity to S, and Stop Bits to 1. When dialing in, the autobaud feature requires you to hit the <RETURN> key repeatedly after the connection is made so that the receiving modem can determine the baud rate. When you see the prompt (# for local numbers, UNTMODEMS> for the metro lines) you can enter one of the following commands to connect with the system of your choice.

SYSTEM	SYTEK/DENTON LINES (#)	METRO LINES (UNTMODEMS>)	INTERNET (CUTCP, NCSA)
<i>ACS Host Systems</i>			
MUSIC/SP (line editing & PCWS)	CALL 8040	N/A	N/A
Academic Mainframe (MUSIC, CMS, Academic COM-LETE)	CALL 3270	CONNECT VM3270	tn3270 vm.acs.unt.edu —OR— telnet vm3270.acs.unt.edu
VAX (VMS)	CALL DEC	CONNECT DEC	telnet vaxb.acs.unt.edu
Solbourne (UNIX)	CALL 900	CONNECT SOL	telnet sol.acs.unt.edu
<i>Departmental Systems</i>			
Computer Sciences Sequent (Ponder)	CALL 780	CONNECT PONDER	telnet ponder.csci.unt.edu
UNT Libraries' on-line card catalog	CALL 3000	CONNECT LIBRARY	telnet library.unt.edu

To exit from the local phone lines, press <ESCAPE><RETURN>, and type DONE (at the # prompt), then press <RETURN><RETURN>. To exit from the metro lines, press <CTRL-SHIFT-6>, then type DISCONNECT (at the UNTMODEMS> prompt), then press <RETURN>. Exiting from telnet and TN3270 is dependent upon the package. CUTCP uses <ALT-X>.

HOURS FOR UNIVERSITY OF NORTH TEXAS COMPUTER ACCESS AREAS : Summer 1992

Day of Week	Willis Library Lab	ACS Lab (ISB 110)	Other General Access Labs:	General Access Lab Locations:
Monday - Thursday	Open 24 hours a day	7:30 a.m. to 10 p.m.	8 a.m. to 10 p.m.	☆ BA: 330, 332 ☆ Chilton Hall: 255, 116 [Adaptive Lab] ☆ GAB: 330, 550 ☆ ISB: 110, 205C ☆ Matthews: 309 ☆ Willis: 134 ☆ Wooten: 120
Friday	Open 24 hours	7:30 a.m. to 6 p.m.	8 a.m. to 5 p.m.	
Saturday	Open 24 hours	9 a.m. to 6 p.m.	10 a.m. to 5 p.m.	
Sunday	Open 24 hours	1 p.m. to 10 p.m.	1 p.m. to 10 p.m.	

This issue of Benchmarks was produced by the Documentation Services section of Academic Computing using Xerox Ventura Publisher on a 386SX clone and printed on an HP LaserJet III SI. Unless otherwise noted, articles or information may be reproduced for nonprofit purposes provided the publication and issue are fully acknowledged.

Continued from page 1.

On a national level, much of the focus on instructional technology seems to be about enhancing the environment in which the instruction is provided. One recent example appeared in the September 4, 1991 issue of the *Chronicle of Higher Education* — Vanderbilt University's Advanced Electronic Classroom was featured.¹ Such facilities, while potentially very useful, are often very expensive and impractical to implement on a large scale. (How many classrooms do we have at UNT?) Often, however, technology can be integrated into the curriculum or provided as a supplement to classroom activity. In other words, perhaps it's not as important to change the place where the information is provided as it is to increase the options that students have for receiving or discovering that information.

Technology can affect instruction in at least three ways, listed below. Keep these in mind as you read this issue and contemplate the use of instructional technology in your own area.

- ❶ **Modification/expansion of the curriculum** — the introduction of technology can affect what or how much can be taught. To give a very simple example: If I have a calculator to provide me with square roots, then perhaps less time can be spent on learning the derivation of square roots and more time can be spent learning the theory and application of the Pythagorean Theorem.
- ❷ **Enhanced presentation/student comprehension** — television has made us a society that is very receptive to visual and aural communication. Multimedia can aid the comprehension and retention of information (if you don't believe this, then ask yourself how you ever

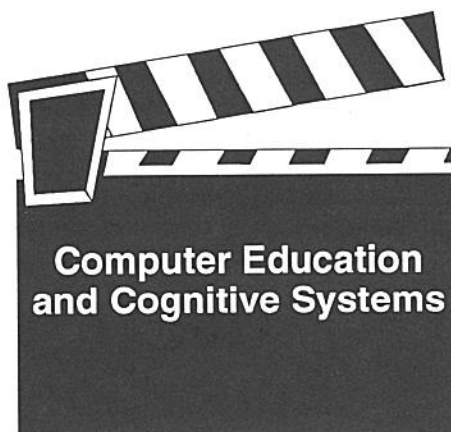
¹ "The Electronic Classroom" by Beverly T. Watkins, *Chronicle of Higher Education* (Vol. 38, No. 2, Pp. A26-A28).

heard of Willie Horton). Interactive simulation can further enhance the learning process by internalizing the discovery of concepts. (Your mother told you that fire was hot, but when did you really learn that concept?)

- ❸ **Enhanced student-instructor interaction** — electronic communication can benefit student and instructor both, providing the same benefits that we find in business application of such technology: efficient distribution of information, location independent communica-

tion, "out of time" communication, etc.

The departments highlighted in this issue, we believe, are representative of the current state of instructional technology at UNT. If we have neglected a department, we apologize. Please contact us and we will try to cover your area in a future issue. That said, read on to see what's happening here at UNT. You will discover many exciting things going on right here on your own campus. ■



Teaching Instructional Technology at UNT

By Claudia Lynch, *Benchmarks* Editor (BITNET: AS04@UNTVM1)

If you venture up to the third floor of Matthews Hall, you will come upon the offices and computer laboratories that comprise the Department of Computer Education and Cognitive Systems (CECS), a division of the College of Education. This is the place to come if you want to learn how to "do" instructional technology.

CECS was formed during the 1987-1988 academic year when the University reorganized an interdisciplinary program that existed between the College of Education and Computer Sciences department. Faculty members from both areas were drafted to become a part of the new department. Currently, CECS consists of the following full-time faculty members. Their areas of specialization are listed beside their names:

- ❶ **Kenneth Brumbaugh** (Ph.D. Wayne State University) — Science education, interactive video, computer graphics.
- ❷ **Kathlyn Canaday** (Ph.D. University of North Texas) — Computer-based learning, laboratory supervision.
- ❸ **Raymond Coopender** (M.S. University of North Texas) — System configuration, hardware coordination.

- **Terry Holcomb** (Ed.D. Indiana University) — Media administration and facilities, message design, computer-based education.
- **Gerald Knezek** (Ph.D. University of Hawaii) — Computer-based education, telecommunications, educational psychology.
- **Cathleen Norris** (Ph.D. University of North Texas) — Computer-based education, artificial intelligence, computer-assisted instruction.
- **James Poirot** (Ph.D. Texas Tech) — Computer-based education, artificial intelligence, computer-assisted instruction.
- **Paul Schlieve** (Ph.D. Southern Illinois University) — Instructional technology, educational media, interactive video.
- **Jon Young** (Chair, Ph.D. Brigham Young University) — Instructional psychology, interactive video, instructional design.

Advanced Technology Lab

One of the major features of the CECS department is the Advanced Technology Lab (Matthews 322). Audio-visual editing, multimedia development and telecommunications are the primary ongoing activities in this lab. The Advanced Technology Lab contains a wide range of multimedia equipment and microcomputers, including IBM PS/Is, Amigas, and Macintoshes. The intent of CECS with regard to the lab, according to Dr. Jon Young, CECS Chair, is to have cutting-edge technology in special courses (for example, this semester's Interactive Video class taught by Dr. Paul Schlieve), and then push that technology into lower-level classes in following semesters.

While the Advanced Technology Lab is not available for use by anyone outside the CECS department, it is possible for faculty members in other areas of the University to hire students for multime-

dia project development and/or rent equipment from the lab. There is a plan to have multimedia support in the Matthews Hall general access lab (Matthews 309) by spring 1993. At that time, any student or faculty member at UNT will be able to work on their own multimedia projects.

Programs of Study

CECS offers undergraduate course work in the areas of computer education and instructional technology. Texas Education Agency endorsements in Information Processing Technology (IPT) are offered, but no degree programs are available to undergraduates.

A variety of options are available to those who wish to pursue a Master of Science in CECS. People who want to make a career in the public school systems can take courses that emphasize the application of computers and tech-

nology in the public school environment. Other students might choose to focus on the application of technology to private and government organizations.

Regardless of their focus, all master's level students in CECS must take courses in cognitive systems - learning about human thinking, human/machine interaction, artificial intelligence, and the development of intelligent tutoring systems applications.

The Master of Science in CECS is the only degree of its kind in the Southwest and there is no equivalent doctoral degree in the entire United States. It is hoped that a doctorate in this area will be approved at some time in the future. In the meantime, it is possible to pursue doctoral study in this area through the interdisciplinary Information Science program or one of several other programs offered by other departments within the College of Education. ■

The Texas Center for Educational Technology

Facilitating Technologically based Learning and Teaching in Texas

By Claudia Lynch, *Benchmarks* Editor (BITNET: AS04@UNTVM1)

Information for this article was obtained from TCET promotional material, interviews with CECS faculty and TCET staff members, and Tex-CET Times, A Quarterly Newsletter for Users of Technology in Education (Vol. 2, No. 2 and Vol. 2, No. 3).

The Texas Center for Educational Technology (TCET) is a university-based research and development consortium whose mission "is to promote research and development collaboration between industry and education in order that technologies and applications can be created and adapted for integration into the public school system."¹ The administrative offices and main activities of TCET are located at UNT, with the University of Texas (UT)-Austin and the University of Houston at Clear Lake (UHCL) as second-site collaborators. TCET was established in June 1990 and is funded by a legislative mandate by the Texas Education Agency and the State Board of Education.

¹ *Tex-CET Times* (Vol. 2, No. 3, p. 1).

The Executive Director of TCET is Dr. Ken Brumbaugh, a UNT CECS faculty member who was chosen by the Texas Education Agency (TEA) after a nationwide job search. Dr. Kathleen Holmes of Denton is Operations Manager. There is also a Governing Board made up of TCET members.

Research and Development Laboratories

TCET serves the Texas Education Agency, school districts, universities, community colleges, education service centers, businesses and professional organizations involved in developing, using, and distributing educational technology items. To facilitate the research and development of educational technology items, TCET has created the following ten research laboratories.

- ① **Educational Telecommunications and Informatics** (Site: UNT, Principal Investigator: Dr. Gerald Knezek) — The main focus of this lab is studying computer-based information exchange, telecommunications and distance learning. Development of user software for a future TCET information system and a Children's Computer Inventory are also underway here.
- ② **Instructional Design and Evaluation** (Site: UNT, Principal Investigator: Dr. Terry Holcomb) — Work at this lab focuses on the design and development of educational technology consultation products and services, including videotapes, summer institutes, written materials, and personal assistance.
- ③ **Collaborative Software Development** (Site: UT-Austin, Principal Investigator: Dr. George Culp) — College student/classroom teacher pairs produce instructional computing applications and utilities at this lab.
- ④ **Technology and Thinking Skills** (Site: UHCL, Principal Investigator: Dr. David Palumbo) — This lab is involved with accessing the im-

pact of computer-based technologies as they relate to higher order thinking skills and researching the creation of hypermedia-based learning systems.

- ⑤ **Teacher Retention and Support Networks** (Site: UT-Austin, Principal Investigator: Dr. DeLayne Hudspeth) — The focus of this lab is on using technology to retain high-quality teachers in the teaching profession and facilitating communication between master teachers.
- ⑥ **Curriculum and Instruction** (Site: UNT, Principal Investigator: Dr. Jim Poirot) — Investigators in this lab are researching the use of technology, including integrated learning systems, in general curriculum areas.
- ⑦ **Technology and Emerging Delivery Systems** (Site: UNT, Principal Investigator: Dr. Paul Schlieve) — Evaluating emerging technologies and advising on their application in education are the main focuses of this lab.
- ⑧ **Student Learning and Special Populations** (Site: UNT, Principal Investigator: Dr. Bertina Hildreth) — This lab focuses on providing technological support for the education of individuals who are learning disabled, physically disabled, mentally retarded, and/or emotionally disturbed.
- ⑨ **Technology and At-Risk Populations** (Site: UNT, Principal Investigators: Dr. Jim Poirot and Dr. Kathleen Norris) — The main focus of this lab is using technology to improve at-risk inner-city children's reading skills and freeing teachers to teach.
- ⑩ **Ethnographic Technology Studies** (Site: UNT, Principal Investigator: Dr. Karen Ford) — Educational technology environments are being explored in this lab through the use of qualitative, ethnographic research methods.

A variety of media (booklets, videotapes, software, etc.) are available as a testament to the fruits of TCET research and development since its inception. Among these are two booklets "K-12 Planning Guide for Videodisc Usage" and "Technology Excellence Projects 1991," and a workbook entitled "Assessment and Evaluation of Integrated Learning Systems: A Kit for School Districts."

Products and Services

A catalog of products and services is available from TCET (UNT Box 5155, University of North Texas, Denton, TX 76203 Phone: 817-565-4433 FAX: 817-565-4425). Among the services offered are teacher training and consulting.

TCET research and development sites offer special summer classes to provide training in technology for selected teachers. Educational technology classes are also taught by TCET staff members throughout the academic year at their respective campuses. TCET will also work with schools, districts, and education service centers to provide consulting, training, and assistance with all aspects of educational technology.

Membership

Membership to TCET comes in five flavors: Individual, District, Associate, Partnership, and Sustaining members. While membership fees and benefits vary by category (Texas individual: \$25/year - Sustaining: contribution of \$100,000 and up), all members can:

- arrange to participate in TCET research activities.
- receive TCET newsletters and annual reports.
- receive catalogs and mailings on products/services.

- purchase TCET products at discounted prices.
- receive updates on TCET activities.
- be eligible for seats on the TCET Governing Board.

UNT is a founding member of TCET; so all UNT departments, faculty and staff members are eligible to purchase TCET products at member prices. Further information about TCET membership can be obtained by contacting the center at the address listed earlier in this article. Additional information about TCET is available via anonymous ftp from tcet.unt.edu ■

TCET Project in Line for Award

According to an article in *TexCET Times* (April 1992, Vol. 2 No. 3, p. 2), the *geoInformatics* lab at Sanger ISD has been nominated for a 1992 ComputerWorld-Smithsonian Award in the category of Education and Academia. The lab, a project of Sanger ISD (David Moore, Director of Technology) and TCET's Educational Telecommunications and Informatics Lab at UNT (Gerald Knezek, Manager), was nominated by EDS Corp.

GeoInformatics is a telecommunications program that incorporates satellite, LumaPhones, amateur radio, and amateur television into the curriculum. More information about *geoInformatics* can be obtained by viewing TCET's videotape "Partners: the TCET/Sanger Connection," available from TCET.

Finalists for the ComputerWorld-Smithsonian Award will be honored at a dinner in Washington, D.C. on June 8. The winners of the awards will be announced at this time. An exhibit of the winners' work will open later at the Smithsonian's National Museum of American History. ■

Professional Development Centers *Bringing Texas Public Education into the 21st Century*

By Claudia Lynch, *Benchmarks* Editor (BITNET: AS04@UNTVMI)

Some of the most important decisions ever made concerning education in Texas were made during the regular session of the 72nd Texas Legislature (1989-1990). It was during this session that House Bill (H.B.) 2885 was passed.

H.B. 2885 provides "Texas institutions of higher education with approved teacher education programs the challenge and the opportunity to become primary facilitators for the professional staff development of teachers and administrators through field-based programs, activities, and services that have been collaboratively developed."¹ In other words, colleges of education are being encouraged to "go out in the field" - to public schools throughout the State.

Professional Development Centers

The catalyst for this change in focus for colleges of education throughout the State is the establishment of Centers for Professional Development and Technology, otherwise known as Professional Development Centers (PDCs). The Texas Legislature, during the 72nd session, authorized the State Board of Education and the Texas Education Agency (TEA) to grant funds for the establishment of PDCs throughout the State.²

All sixty-six Texas colleges and universities with approved teacher education programs are eligible to apply for grants to help establish a PDC. Their application, however, must be in conjunction with a public school district, and the school district must submit an up-to-date technology plan. The Texas Center for Educational Technology (TCET) has been mandated by the Texas Legislature to assist schools in planning and implementing activities related to K-12 technology. School districts have until May 31, 1992 to submit a technology plan.

The UNT/DISD Professional Development Center

The UNT/DISD Professional Development Center is a prototype Center for Professional Development and Technology. "The center is a collaborative effort among the Dallas Independent School District (DISD),³ University of North Texas (UNT),⁴ Region 10 Education Service Center (ESC 10), Project Bluebonnet (SchoolLINC),⁴ Texas Center for Educational Technology (TCET), and private sector technology corporations."⁵

¹ "Excellence and Equity in Texas Education: The Role of Centers for Professional Development and Technology" by Lionel R. Meno and Richard Swain, *Texas Teacher Education Forum* (Spring 1991, Vol. 17, p. 12).

² One hundred million dollars of new state funding is available for apportionment to schools whose technology plans are accepted by the TEA.

³ There is a good possibility that the Denton Independent School District will be joining the PDC in the future.

⁴ SchoolLINC is a distance learning project that enables students in rural districts to have access to classes not offered at their schools.

Instructional Technology at the University of North Texas

The mission of the UNT/DISD Professional Development Center is two-fold:⁶

- ① To collaborate in developing and providing exemplary, results-based educational experiences, including technology accessibility, for an economically and culturally diverse urban student population.
- ② To develop and renew exceptional teachers and other educators for urban schools through the integration of technology and effective teaching practices into the preservice and staff development training of teachers and administrators.

In order to accomplish these missions, the PDC has begun:⁷

- establishing programs in Dallas schools that are a part of DISD's School-Centered Education initiative.
- instructing preservice (student) and renewal (returning) teachers in results-driven planning and teaching models. These people will then serve as interns to reduce the adult/student ratios in PDC schools.
- addressing the equity issue of technology access for urban students through technology delivery to PDC schools.
- recruiting teaching candidates who are committed to teaching in urban schools, from both traditional and nontraditional sources (Preservice Teacher Education).

⁵ "UNT/DISD Professional Development Center North Texas SchoolLINC Cluster Executive Summary" November 13, 1991 (Handout).

⁶ Ibid.

⁷ UNT-Dallas sites are expected to be operational by summer 1992. Other sites will be added as soon as financially possible. Planned site additions include Plano ISD, Sanger ISD, and several rural counties along the Red River which comprise the North Texas Educational Network (NTEN).

- integrating distance learning and other technologies that will be found in classrooms of the future into the preservice program in PDC schools.
- offering a full range of staff development activities. Collaborative projects between school-based and university-based practitioners have begun.
- distance learning projects. Staff development programs can be transmitted to other SchoolLINC sites or stored on videotape for later dissemination.
- research and development on the effectiveness and effects of technology-based instructional paradigms.
- research on and development of solutions to the problems in urban education and teacher education.
- site-based decision making, collaborative planning, and shared governance in some program elements.
- equipping PDC schools with the technology and software to develop, test, and implement technology-based instructional paradigms.

UNT/DISD Technological Offerings

All schools that are a part of the UNT/DISD Professional Development Center will be connected to UNT and other SchoolLINC sites by a fiber optic cable system. They will also have computers with rich instructional environments. This will provide teachers and students with the ability to have two-

way full motion video conferences and give them access to multiple information sources, major libraries, CD-ROM information, image databases, and satellite systems such as the NWS and CNN.

At least one classroom at each school site will be equipped as a "classroom of the future." UNT will also have a classroom of the future. These classrooms will have two to three video cameras to focus on the students, teacher, and materials. Computers in a ratio of at least one computer for every three students will be available. Other components of these classrooms of the future are:

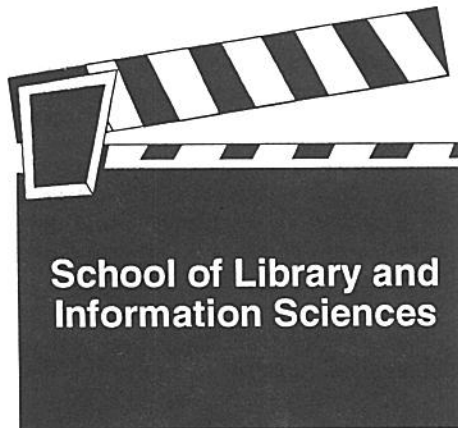
- two big-screen TV monitors.
- a fiber optic cable system with adequate bandwidth for two-way video communication and data communication.
- a file server.
- a teacher control console.
- echo canceling audio.
- a telephone and FAX link.
- support software.

Additional Information

More information about PDCs can be obtained by contacting Dr. Gerald Ponder of the Secondary Education faculty, who is Director of the UNT/DISD PDC (565-2826). TCET also has information about PDCs, including an informational multimedia presentation. Arrangements to view the multimedia presentation should be made with Dr. Kathleen Holmes, TCET Operations Manager (565-4433). ■

CECS Hosts National Conference

NEEC '92, the National Educational Computing Conference, will be at the Loew's Anatole Hotel in Dallas on June 15-17, 1992. CECS is hosting the conference, whose theme is "windows to the world." The theme is a reference to the ever-growing ability, through technology, to view and interact with the world from the classroom, office, and home. A preliminary program for NECC '92 is available via anonymous ftp from tcet.unt.edu in the directory pub/NECC92/NECC_92_program.PGM.Hqx Information is also available from CECS, UNT Box 5155, Denton, TX 76203 (817-565-9383). ■



Computer Technology and the Educational Process

By J. Norton, SLIS Lab/LAN Manager (BITNET: IE25@UNTVAX)

For more than ten years the School of Library and Information Sciences (SLIS) has been using computer technology as a component of the educational process. The original computer lab for SLIS was opened in 1981, but the School was teaching courses in on-line searching and on-line catalog development long before desktop computers became available. Automation entered the field of library and information sciences earlier than many other disciplines; electronic on-line catalogs, on-line database searching, automated indexing systems, and so on, all became part of work in the field more than three decades ago. The advent of the desktop computer merely increased the ability to organize, store, and access information and extended availability of computer-assisted information systems to a much broader audience.

The SLIS Lab

The School of Library and Information Sciences opened a new computer lab this February, in room 205C on the second floor of the ISB. The lab operates from a Novell File Server, but has computers with stand-alone features as well. Although the lab provides support specifically to SLIS students during weekday morning hours, afternoon, evening, and weekend hours the lab is a General Access Lab for graduate students only. To support this general access function, the SLIS lab is trying to build a collection of software that will provide services more specific to the needs of graduate students, particularly those who may not be served by existing restricted departmental labs.

Currently, the lab provides access to the UNT Library CD-ROM resources and the UNT Library on-line catalog. However, because CD-ROM technology has radically changed the nature of electronic databases and has become a critical concern to the field of library and information science, the SLIS lab also has several on-site CD-ROM stand-alone systems that are available to students; these include Books in Print, Ulrich's, Medline, NewsBank, and Wilson On-disc. SLIS teaches several courses that focus on specific types of databases and database services. Hence, the SLIS lab has resources to permit access via the Internet to full on-line database vendors such as DIALOG. The SLIS lab also provides Internet access for students with VAX accounts, and work is in process to provide direct Telnet access to the

Please see SLIS on page 9.

SLIS Overview

By Cynthia Koepp, *Benchmarks*
Assistant Editor (BITNET: AC03@
UNTVAX)

The School of Library and Information Sciences (SLIS) has its main office in the Information Science Building, room 205. SLIS offers a program of study leading to the Bachelor of Science degree, but it is the Master of Science degree that is considered the first professional degree. Students in the master's program (which is accredited by the American Library Association) may choose concentrations in either library or information science. They may concentrate on a specialized information setting: academic libraries, public libraries, special libraries or learning resource centers, or they may concentrate on a service or activity, such as: automation and information processing, music library and information services, or cataloging and technical services.

A doctoral program in information science is offered through the Center for Interdisciplinary Studies. SLIS is featured in this program, as are the departments of: Business Computer Information Systems, Communication and Public Address, Computer Education and Cognitive Systems, and Computer Science. The mission of this program is to provide a center of excellence in graduate education and research in three related areas: accessibility, communication, management and use of information resources; human communication and information behavior and the systems and technologies that enhance communication and learning; information and communication processes in managerial, organizational, social and technical environments and the accompanying analysis, design and evaluation of information systems. ■

SLIS continued from page 8.

Internet by mid-summer. SLIS students, like all graduate students, need to have access to, and familiarity with, CD-ROM databases and electronic online database services for their own research work, as well as for their future careers as information professionals. The on-site CD-ROMs and wide area network access allow SLIS to provide a wider variety of hands-on experience with a vast array of research sources.

Most SLIS courses now involve at least some computer activities designed to engage students in real-world computing problems and many provide significant levels of computer interaction. The SLIS lab has statistics software such as CRUNCH4, SPSS, SAS; bibliographic software, including InMagic and ProCite; and demonstration programs, such as Winnebago Circulation and Cataloging, Library of Congress CD-MARC, and ERIC on-disc. Database applications are supported by FoxPro; word processing is available using WordPerfect 5.1; and spreadsheet work is handled by PlanPerfect. The LAN connections from the lab also allow students to use some of the software available on other lab servers. Students with VAX, PONDER, SOLBOURNE, or VMS accounts can also access some of the software available on those systems from the SLIS lab. Once hardware upgrade to 386SX machines is completed, almost all the software on campus will be accessible from ISB 205C.

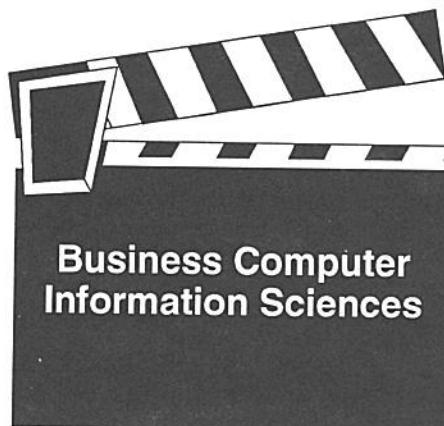
The SLIS Educational Process

Computer technology provides practical application of the theoretical aspects of information organization, storage and access. Design and use of information technology has been and continues to be a significant component of the SLIS educational process, as well as an ongoing and increasingly large part of the information behavior

patterns of both faculty and students. SLIS faculty use the connections of the SLIS Administrative LAN to keep track of developments in the field, to participate in electronic conferencing, and to debate via bulletin boards with colleagues in other parts of the world. Presently electronic mail is used to supplement meetings and conferences and to keep students informed of activities. Some SLIS classes are enrolled in an Internet bulletin board that follows topics of interest in the library and information science field. Plans are in progress for the migration over the next one to two years of significant portions of formal and informal communication with SLIS students to electronic for-

mat, including submission of and response to papers and projects, administrative memos, and intraclass discussion between class meetings, as well as general announcements and communications to the entire SLIS student body.

The use of computer technology and the SLIS lab are integral to the School of Library and Information Sciences. The increased use of computer technology in the educational process and the projected expansion appropriately reflects the changing role of library and information science professionals in the design and delivery of computer-assisted information products and services. ■



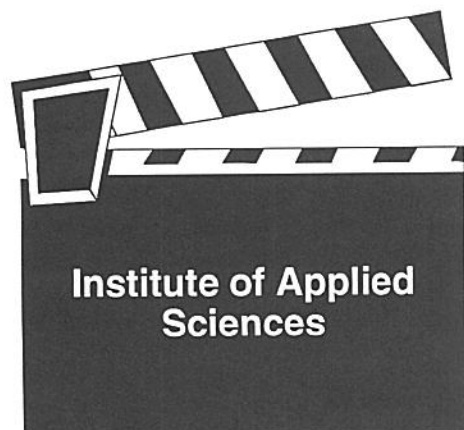
The Electronic Connection

By Cathy Hardy, Academic Database Consultant (BITNET: AC55@UNTVM1)

It's 4:30 p.m. Friday and you have a question about a project that is due Monday. Uh oh. If you are one of over 3,500 students in the Business Computer Information Systems (BCIS) Department, you'd just send your instructor electronic mail (E-mail). Most of the BCIS/MSCI faculty read their E-mail daily and you would have an answer in time to work on your project over the weekend.

Depending on the class and instructor, you may be sending a message over Pegasus mail (over the COBA student network), VAX mail, or, for mainframe student accounts, CMS or MUSIC mail. Not only does E-mail allow easy communication between faculty and students, but also between students themselves. With all those infamous College of Business "group projects" E-mail facilitates communication between geographically scattered group members.

Once you've tried it, it's difficult to imagine life without a copier. The same holds true with E-mail. When questions come up in class, instead of researching the question and bringing the material to the next class meeting, the instructor can use E-mail to send a message or file to the entire class. Is there a problem with or question about an assignment? The instructor can make a refinement to the assignment requirements and get the information to the students in a timely manner. The use of E-mail definitely makes school life easier for both the instructor and the student. ■



Computing and Instruction in IAS

By Billy Barron, VAX/UNIX System Manager (BITNET: BILLY@UNTVAX)

The Institute of Applied Sciences (IAS) is an interdisciplinary institute that applies knowledge from several different science-related departments to real world situations. The program is very practical with a minimal amount of theory. One of the major areas of IAS is the environmental sciences, and I will be focusing on that component of the institute in this article.

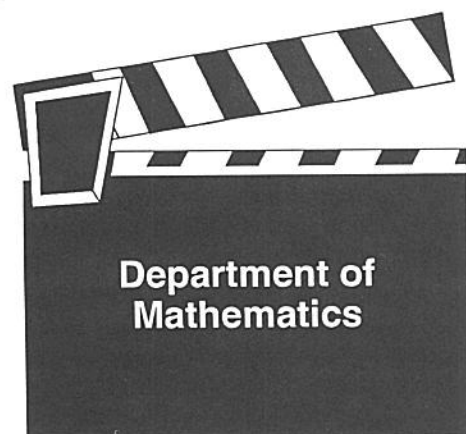
Two of the major computer uses within the program are Remote Sensing and Geographic Information Systems (GIS), which are both examples of Image Processing. Remote Sensing uses satellite collected data to inventory, evaluate, and monitor land use, water resources, nonpoint source pollution, cropland and rangeland conservation practices. A GIS combines the remote sensing data with spatial data (e.g. soil type, topology, hydrology, and political boundaries). The GIS then can be used to address environmental problems. The students are trained on a variety of GIS packages including IDRISI, ERDAS, and ARC/INFO on either the PC or VAX platforms.

Until recently, the students were only given examples of how Image Processing was used in the environmental science field, but had no hands-on experience with the GIS and Remote Sensing systems. The students only performed small calculations by hand. According to Dr. Sam Atkinson, IAS faculty member, the addition of computers has made the academic experience much fuller in this arena.

Instructional computing is also being used to calculate the spread of hazardous waste in the ground. SAS is used for all kinds of statistical analysis including univariate and regression. Previously these calculations were done by hand.

Students are introduced to and use graphic packages such as Harvard Graphics, Quattro Pro, and Lotus 1-2-3. Finally, word processing is also used by students.

Overall, computing has allowed students in the Institute of Applied Sciences to get more work done in less time. They have a much richer academic experience since more material is covered due to the time saved by computer calculation. ■



Enhancing Mathematics Through Technology

By George Morrow, ACS Staff Member (BITNET: AS01@UNTVM1)

While posing this question to some of the faculty in the Department of Mathematics: "How are you using technology to enhance the educational process?" I got not much of an answer to that question, but instead an enthusiastic response of how things could be with a little more in the way of computer software and hardware and more incentives offered through the College of Arts and Sciences for efforts to incorporate technology in classroom presentations.

Presently all math faculty have microcomputers which they use mostly in composing research papers, with some wide area networking utilized for collaborating on research nationwide. Hence, little computer technology is in direct instructional use, with the exceptions of some classroom usage for courses such as Numerical Analysis and Differential Equations.

Dr. John Neuberger, Math faculty member, has perceived the inevitability of the upward spiral in usage of computing and other technologies in math classrooms at this university. He observed such in a consortium of five universities in Massachusetts including: Amherst, University of Massachusetts, and Mount Holyoke.

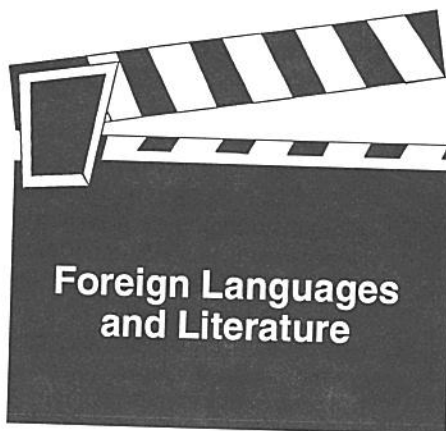
One area which is ripe for the inclusion of more instructional technology tech-

niques is that of remedial courses in math and other disciplines. At North Carolina State University, innovative programs for the interactive presentation and monitoring of remedial math courses have been developed. Dr. Neuberger hopes to soon see such development encouraged here at UNT.

Dr. Neuberger has noted a high correlation between the quality of equipment and software available to faculty and their enthusiasm to integrate instructional technology into classroom presentations. He believes that a computer lab within the math department would be a great stride toward promoting the use of computer technology by both faculty and students. In 1989, Drs. Henry Warchall and Neal Brand applied for an NSF grant to install computer lab equipment, but it was not funded.

Numerous graduate courses in mathematics could be enhanced by the inclusion of a symbolic manipulator. Such software could be used for a "quick and easy" graphical presentation of a complex function under consideration. Emerging symbolic manipulators include: Mathematica, Derive, Macsyma, and Maple. A comparison of these general purpose mathematical programs is presented by Dr. Barney Simon of the California Institute of Technology in *Notices of the American Mathematical Society*, (Vol.37, No. 7). Mathematica is available here at UNT on the Solbourne system.

National trends in this area combined with the enthusiasm seen in UNT's Math Department seems to indicate that Dr. Neuberger's prediction of computer technology infiltrating most aspects of the teaching of mathematics will become a reality. ■



Technologically Speaking ...

A High Tech Lab for Foreign Language Learning at UNT

By David Lively, Lab Supervisor

The Foreign Languages and Literature Department's Audio/Video/Computer Lab (LANG 105) is helping students to learn foreign languages better. While other language labs (LANG 106, 107, 107A, and 109) are scheduled as part of the first-year curricula, LANG 105 is a "walk-in" kind of affair, open to all students. Following are some of the central features of the lab.

Video

In the central portion of the lab are 24 Panasonic video stations for individual viewing of videotapes. Students check out headphones with their UNT ID cards and request a video. The lab assistant will assign a station number and insert the tape into a player, located behind the service counter. Each viewing station has a remote control for its assigned VCR, so the student can start, stop, wind, rewind, and search the tape from the carrel. Two of the carrels are designed for use by persons confined to wheelchairs.

Videotape programs are available in French, German, and Spanish. Most are instructional series produced by the BBC, the CPB/Annenberg Project, InterNations (Bonn), and similar organizations, as well as by the publishers of adopted foreign language texts. Additionally, we currently have licenses to tape three series broadcast over satellite. Received monthly, they are *Schauplatz Deutschland/Germany Live*, *France-TV Magazine*, and *Spanish-TV Magazine*. The German series is subtitled in English, and the French and Spanish programs are accompanied by printed materials which are mailed to us each month.

Audio

At the north end of the lab are 28 Tandberg audio stations for playing (and recording) cassette tapes. Students check out headsets with their ID cards and either request lab copies of tapes or give their own copies of tapes to the lab assistant for insertion into the recorders, which are located behind the service counter. The lab assistant will assign station numbers. Each carrel has its own remote control, by means of which students can play the tape, stop, wind, rewind, recap (replay the previous phrase), and set and find "bookmarks" for easily locating desired portions of a tape. A diagram showing these various functions is displayed in each carrel. Two of the carrels are designed for use by persons confined to wheelchairs.

The lab will make copies of the lab tapes for students. They should supply us with blank 90-minute cassettes of good quality and fill out a copy request form in the 108 lab. Tapes are usually ready for pickup within a few hours. Students can use these tapes in 105 to record and re-record their responses (on the student track) alongside the prerecorded material (on the master track) for comparison and later study — the tapes can be played on home or auto stereo systems. (Tapes belonging to the lab have had the erase-protect tabs removed to prevent students from recording on the student tracks.)

The material consists exclusively of the audio programs accompanying the first and second year texts currently in use. Since those textbooks have been adopted by the department, we are permitted to provide copies to language students at no charge and we remain in compliance with the copyright laws.

Computers

The south end of the lab offers ten carts containing AT-compatible, networked computers for language study. So far, our software holdings are limited, but we will definitely acquire more programs in the future.

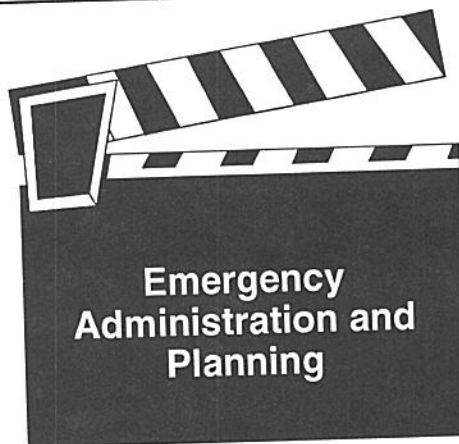
- **Spanish** — Spanish Troubleshooters, to accompany *Foundation Course in Spanish*, 7th ed. Exercises keyed directly to the textbook. Seven to 16 exercises in each of 22 chapter groups.
- **German** — (1) *Tuco II*. Drills and exercises on 40 grammar topics in four modules. Sentence completion, simple translations, and scrambled sentences.
(2) *Language Coach* to accompany *Wie geht's*, fourth edition. Vocabulary, grammar, and reading comprehension drills keyed directly to the first-year German text.
- **French** — At this time, there is no IBM-compatible software available

from Heinle & Heinle, the publishers of our first-year French text. Their representatives have promised to send a loan copy of their bilingual word processing program, *Système-D*, as soon as it becomes available (we are on a waiting list). It features a bilingual dictionary, a French reference grammar, an idiomatic phrase index, and is networkable. Unfortunately, the high cost of the program may make it unfeasible for departmental purchase (depending on enrollment in our French program; the

"list price" of the software is \$500-\$2,000, plus an annual usage fee of \$250-\$1,000!).

Further Information

LANG 105 is currently open from 7:45 a.m. to 7 p.m. Monday-Thursday and from 7:45 a.m. to 5 p.m. Friday. Further Information about the lab can be obtained by contacting David Lively, Lab Supervisor or Dr. Kjell Johansen, Lab Director (817-565-2404) ■



CAI in EADP

By Eric Lipscomb, ACS General Access
Lab Manager (BITNET: LIPS@UNTVAX)

Students taking classes in the Department of Emergency Administration and Planning (EADP)

have seen a different type of instruction over the past few years. Col. Bob Reed, the department's director, has been using a software product called HyperGraphics to assist in the preparation and presentation of class material.

"In most of our classes, we use computer-assisted instruction," says Reed. "We make electronic transparencies, vis-a-vis the old 'poor boy slides' and acetate transparencies. We don't have to do the old sliding paper trick." Reed uses HyperGraphics to prepare his materials well in advance of the lecture, so that by the time he is ready to present the material, his presentation is already practiced and polished. The electronic transparencies also provide an inexpensive way to change and update visual aid material.

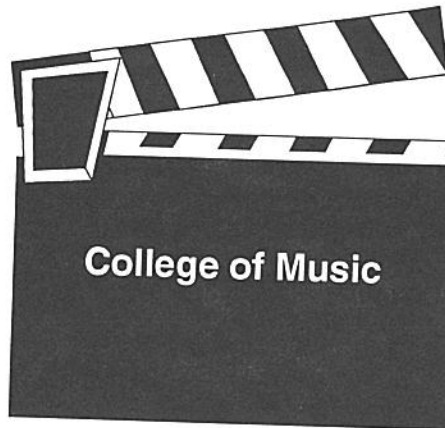
For each class, Reed takes his laptop computer with the prepared lecture to the classroom, along with a Kodak LC 500 color projector. Setup for the class is simple—connect the computer to the projector, boot the program and start stroking the space bar.

Students benefit from computer-assisted instruction (CAI) in several ways. First, they are more attentive and take better notes. "We're a very visual society; television has done that for us," explains Reed. Not only do students respond better to the visual presentation, but the information can be tailored in ways to make it more understandable or descriptive. The advanced preparation forces the instructor to be more organized. The presentation also tends to be tailored to the instructor's personality. If a student tells Reed in advance about missing a lecture, Reed will make his computer available for the student to go through the same lecture the other students in the class got, a far cry from simply copying a classmate's lecture notes.

There are drawbacks, Reed points out. Students may get caught up in watching the presentation and avoid note taking. The moving and set up of equipment is also inconvenient for the instructor. Reed says that he would not use the computer if his classes were of the 50 minute variety because of the inconvenience of transporting and setting up the equipment. The three-hour night classes in EADP fit the CAI method very well. If this technology were supported university-wide, instructional preparation would be much easier.

Reed also oversees several existing computer-based instruction (CBI) courses and is getting grants to produce others. CBI differs from CAI in that the student interacts solely with the computer and does so at his or her own speed. Reed is currently working with the EPA and FEMA to develop training programs for a wide variety of public and private sector officials. These programs can significantly reduce training costs below that of the more traditional lecture methods. A weakness of the CBI method is that the self-paced nature of the course requires considerable student motivation, if the course is to be completed. This then poses a challenge to the course developer to make the course interesting, entertaining, and relevant.

Reed is enthusiastic about the use of CAI and CBI within his program, claiming, "I can't imagine teaching any other way right now." In the future, interactive laser videodisc technologies could improve the quality of education even further. For example, computer-based scenarios can prepare students and emergency responders for actual disasters by running disaster simulations. Reed also hopes that the University will adopt some of the current and future technologies that can facilitate and enhance the classroom learning environment for the entire campus. ■



Computers and Music: a Logical Combination

By Dr. Philip Baczewski, Acting Director of Academic Computing (BITNET: AC12@UNTVM1)

The mix of computers and music does not seem to be such an odd combination in these days of MIDI, Compact Discs, and digital synthesizers, yet it wasn't always so. Fifteen years ago, computers were just beginning to be widely recognized as tools that could be useful to musicians and music teachers. Twenty years ago a limited number of researchers were exploring the musical uses of computer technology, yet the roots of MIDI, CDs, and digital synthesizers extend back over thirty years to a few pioneers working at the end of the 1950s. In 1955-56, Lejaren Hiller and Leonard Isaacson were experimenting with programming the Illiac digital computer at the University of Illinois, to generate various stylistic aspects of music. The result appeared as the *Illiac Suite for String Quartet*, in 1957. By 1959, Max Matthews, James Tenney, and others had collaborated at Bell Telephone Laboratories to produce a useful computer program for the generation of musical sound.

CAI

At the University of North Texas, the involvement of music with computers extends back to the late 1970s. Dr. Rosemary Killam developed a computer assisted instruction system for music theory ear training which was fully operational by 1978. Every musician is faced with the task of "training their ear." Whether it be formal or informal training, repetition is a key element to aural recognition of elements such as chords and scales which form the building blocks of music. Computers are ideal for formal drill and practice in this area: they can repeat a musical element as many times as requested without losing patience; they can provide immediate and accurate feedback as to whether a musical element was identified correctly; and they can chart a student's progress as new skills are obtained.

The first system was based on NT's HP2000 minicomputer and used computerized sound generation hardware developed by Dr. Dan Scott of NT's Department of Computer Sciences. That system has long gone by the wayside, but it provided the foundation for newer developments on Apple II microcomputers as well as today's PC compatible and Macintosh systems. NT's Music Theory CAI lab is still contained in the original Music Building location of Room 1007, and is currently overseen by Dr. Paul Dworak of the College of Music Department of Theory and Musicology. The room is slated to join the General Access Lab system in 1992-93, but will still serve the ear-training needs of NT music students.

Composition

Music Theory is not the only area which has been profoundly affected by the introduction of computer technology. The field of Music Composition has embraced and often lead the way for new developments in this area. It is a composer, John Chowning, whose work at Stanford University is responsible for what we now know as a very successful line of Yamaha synthesizers. (Do the characters DX7 sound familiar?)

At NT, the use of computers in composition again extends back to the late 1970s, when Larry Austin joined the Music faculty. The author's personal experience extends back to this era, when NT musicians were first experimenting with a program called MU-

SIC 360, progeny of Max Matthews original work at Bell Labs and running on NT's IBM 360/50 mainframe. (For those programs, three days was considered excellent turn-around time, and a week was more usually the case.) Technology has come a long way in the intervening years. A desktop NeXT workstation far outpaces anything imaginable that could be done with that mainframe of fifteen years ago. Today, three NeXTs and several Macintoshes are employed in the production and instruction of digital sound synthesis and computer assisted composition.

Other Technology

Another important development for composers has been the advent of music sequencer programs and musical

notation programs. (A sequencer is a program or device capable of remembering sequences of notes.) In combination, these tools provide the composer with the same type of power that a word processor brings to a writer. This additional productivity allows more concentration on the artistic content of a work and less worry about the production of the written musical materials.

There is no doubt that computing technology will continue to be employed in musical endeavors. New ground is still being broken in the areas of digital synthesis and music analysis. Musicians continue to see computers as teaching tools as well, and as artificial intelligence technology enters the fray, we can expect more sophisticated systems to help in the instruction as well as production of music. ■

General Information

UNT Metro Line Problems

By Bill Buntain, Director of Network and Microcomputer Services (Internet: Buntain@ccl1.unt.edu)

The Computing Center is aware of ongoing problems with the Metro dial-in access service to UNT host machines. Our current configuration was a low-cost alternative based on what appeared to be reliable communications technologies, but it has not proven to be stable. We have been attempting for several months to isolate the cause of the communications outages, but given the short time period of each outage, the complexity of the configuration and the number of support organizations involved, this has proven to be a difficult task. We are presently evaluating several alternatives for simplifying the communications configuration for our Metro services. Alternatives being evaluated include:

- Bringing Metro lines directly to Denton (due to costs this may result in a reduction in the total number of available lines);
- Bringing Metro lines to the Texas College of Osteopathic Medicine in Fort Worth which has communications capabilities via a T1 line to UNT; and
- Contracting for services with Metro line service companies or other communications providers.

We welcome any other suggestions. We are committed to providing a quality dial-in service within the constraints placed on us by the State's current budget crisis. Comments can be directed to Bill Buntain, Director, Network and Microcomputer Services (ISB 119, ext. 2324).

If you experience problems with Metro line service, please note the time at which the outage occurs and report this to Network and Microcomputer Services at 565-2316 during the hours of 7:00 a.m. to 10:00 p.m. Monday through Thursday, 7:00 a.m. to 5:00 p.m. on Friday, 8:00 a.m. to 5:00 p.m. on Saturday, or 1:00 p.m. to 10:00 p.m. on Sunday. ■

General Information

Additional Local 2400 Baud Modems Installed

In response to recent high usage demands on the local 2400 baud dial-up line, the Computing Center has increased the number of 2400 baud modems available from 16 to 24 on the 565-3300 rotor. At the same time, we decreased the number of 1200 baud modems on the 565-3499 rotor from 24 to 16. Hopefully, this will resolve the problem with the 565-3300 (and possibly the 565-3461) rotor(s) filling up in the evenings.

One important difference between the already existing 16 lines and the new 8 on the 565-3300 rotor is that the new lines are connected to an AgileNet box. The previously existing lines are connected to Hughes LAN Systems terminal servers. The Hughes terminal servers are capable of making TCP/IP connections to systems that are not on the Sytek LAN, such as Morticia, Lurch, Cube, Soliton, Fractal, etc. If you need access to one of those systems and you get dialed in to one of the new lines, then you will be unable to contact those systems directly. However, all major hosts, such as VAX, CMS, Solbourne, and Sequent, are connected to the Sytek LAN so this is not a problem for the majority of users. When you first connect to any of the 2400 baud modems, you will see a line saying "AgileNet" for the newer lines and "Hughes LAN Systems" for the previously existing modems which will allow you to tell the difference. In the future, all the modems on this rotor will have support for TCP/IP connections.

If you have any problems regarding the new (or old for that matter) dial-up lines, please call 565-2316 and log a trouble report. ■

General Access Lab Semester Break Hours

Location	Dates	Times
ACS Lab (ISB 110)	May 10	CLOSED
	May 11-15	8 a.m.-5 p.m.
	May 16-17	CLOSED
	May 18-22	8 a.m.-5 p.m.
	May 23-24	CLOSED
	May 25-29	8 a.m.-5 p.m.
	May 30-31	CLOSED
	June 1-5	8 a.m.-5 p.m.
	June 6	CLOSED
	June 7	Regular Hours
College of Business (All labs)	May 8	8 a.m. - 4 p.m.
	May 9-June 7	CLOSED
	June 8	Regular Hours
Chilton Hall Labs (225, 116)	May 8	Close at 5 p.m.
	May 9-June 7	CLOSED
	June 8	Regular Hours
Chilton 116 (Adaptive Lab) will open upon request (during normal business hours if adaptive equipment or software is needed. Please call 565-4750 and give advance notice if possible.		
Willis Library	May 9-June 7	8 a.m. - 9 p.m.
	June 8	Regular Hours
SLIS Lab (ISB 205C)	May 8	Close at Noon
	May 9-June 7	CLOSED
	June 8	Open at 9 a.m. — resume
		Regular Hours
GAB Labs	May 8	Close at 5 p.m.
	May 9-June 7	CLOSED
	June 8	Regular Hours ■

Final "Imagine" Program to Air

The final program in the 1992 Apple Education Television Series will air on May 21. The title of this program, or seminar as Apple calls them, is "Client/Server Architecture and Information Access Analysis."

The seminar will be shown from noon to 1 p.m. and can be viewed in the Media Library, Chilton Hall 111 or by tuning to NTV Channel 11. Viewers can call in after the program with questions or comments. For more information, contact the Media Library (565-2480). ■



Information Resources Council News

Minutes provided by Sue Harrison, Recording Secretary

Information Resources Council Members: Philip Baczewski, Computing Center (ex-officio); Dave Barker, TCOM - Physiology; Bill Buntain, Computing Center (ex-officio); Cengiz Capan, College of Business; Carolyn Cunningham, Financial Aid; Jim Curry, Micro Maintenance (ex-officio); Stephen Farish, College of Music; Paul Fisher, Computer Sciences; Frank Forney, TCOM - Academic Computing; Chuck Fuller, Business Services; Don Grose, UNT Libraries; Richard Harris, Computing Center (ex-officio); Tom Newell, Telecommunications; Don Palermo, Admissions; Sue Pierce, School of Community Services; Paul Schlieve, Computer Education & Cognitive Systems; John Todd, Political Science; Ray Vondran, Library and Information Sciences (Chair); Sue Harrison, Computing Center (Recording Secretary).

Tuesday, March 24, 1992

A correction was made to the minutes of the February 18 meeting as follows:
"Jim Curry reported that no space has been assigned yet for him to begin maintaining Apple computers. Vondran said he would make sure the subject was brought up again at the next IRC Steering Committee meeting."

Chairman Vondran presented the proposed Charge of the IRC and distributed copies, noting that he has asked several people, including Deans, to review the document. He pointed out that the main changes thus far have been nomenclature corrections and the addition of oversight responsibilities for the IRC. Vondran asked IRC members to give feedback to the Strategic Planning Committee within the next three weeks so that any suggested changes can be incorporated into a document that will be debated and voted upon at the April IRC meeting.

Chairman Vondran noted that the Strategic Planning Committee (SPC) will begin to review the Agenda prior to each IRC meeting, to ensure that nothing is overlooked. The SPC will also be looking at the constituency of the IRC, then on to the organization of the IRC sub-committees. Consideration is being given to having two standing committees: 1) administrative and 2) academic, both of which would include people who are not actually members of the IRC. Discussion followed.

The IRC commended Dr. Philip Baczewski for a job well done as Interim Sr. Director of Academic Computing.

Cengiz Capan presented minutes of two previous GALC meetings and reported that the committee has begun its annual process of determining the needs of the various colleges in order to make recommendations for additional funds, etc. Minutes from future meetings of the GALC will be distributed to IRC members. Included with the GALC minutes was a spreadsheet from Jim Curry's Microcomputer Maintenance Shop budget. After some discussion of the spreadsheet, Capan asked that further

comments and/or questions about the MMS budget be directed to Jim Curry. Capan reported that the General Access Labs are on track with the various departments working together well.

Coy Hoggard reported that the new IBM 9121-440 has been successfully installed. As much of the memory and channels as the Academic 8083 machine would hold was taken from the old administrative HDS 8083 and added to the Academic machine. The disk subsystem has also been installed and is functioning. The HDS Cartridge Tape System has also been installed and is currently being used for disk back-up activities. Full transition includes upgrading the operating system from MVS-SP to ESA. It is hoped that arrangements can be made to have IBM assist with this effort so that this can be done by mid-July. Otherwise it will be sometime in the Fall '92 semester (maybe later) before ESA can be implemented.

Hoggard asked for an endorsement from the IRC for leaving the existing restrictions on the number of logged-on users during registration intact at least through Summer I '92 registration so that the impact and capabilities of the new system can be better evaluated. Chairman Vondran stated that he felt that no specific endorsement was necessary, but invited comments from the group. Hearing no negative comments, Vondran suggested that Hoggard proceed as planned, and "not do anything foolish." Paul Schlieve asked if a test could be conducted, prior to the next registration period, to see if the new CPU can handle a maximum amount of activity at one time. Hoggard asked for recommendations of people who really need to have their restrictions lifted during registration periods.

Tom Newell presented the report of his Voice Mail Study Committee which made the following recommendations:

- ① acknowledge Voice Mail as a viable technology for use at the University,

General Information

- ② recommend that funding be departmental until such time as more information is available about the source of and/or impact on central funds, and
- ③ approve the Voice Mail standards.

Paul Schlieve seconded the recommendations of the committee and the Council approved them.

Paul Schlieve reported that a working Electronic-mail committee has been formed, which includes members of the Computing Center and his staff. They have identified five Electronic-mail software packages to evaluate and are now in the process of bringing up versions of all of these. They plan to have all of them up and demonstrable by April 15. A brief discussion followed and Schlieve pointed out that the goal of the committee is for each individual to have to deal with only ONE mail system.

Tuesday, April 21, 1992

The minutes from the March 24, 1992 IRC meeting were reviewed and approved after several corrections were made. Corrected minutes will be distributed to the members.

Richard Harris reported that the Strategic Planning Committee had met since the last IRC meeting, during which the bulk of their time was spent going over the agenda for today's meeting, and the IRC Charge. The committee is working toward revising IRC committee structure and IRC composition as well as kicking off a new planning cycle. The committee's plans for the summer will be to identify projects that will occur over the next two years which will involve acquisitions of \$500,000 or more. Harris distributed copies of the State's Strategic Plan.

Bill Buntain distributed copies of a Telecommunications Survey which had been sent to the Computing Center by the State Telecommunications Planning Group. In an effort to develop a new state-wide network plan, information is being requested regarding cur-

rent and future needs of the University. Buntain asked members to complete the survey and return it to him no later than April 28, 1992.

Philip Baczewski reminded the Council that two years ago, in June of 1990, following a year-long study by a UCC subcommittee, a proposal to phase out the MUSIC operating system in favor of CMS, was presented to the University Computing Council. Since the project was rather ambitious in terms of funding, the UCC accepted the proposal and recommended forwarding it to the Vice Presidents for clarification of the funding issues. Those funding issues never got clarified; but in the meantime, the CMS operating system has been developed, in large part because of a request from BCIS, whose students use that operating system heavily. Several of the goals of that subcommittee have been accomplished, and the CMS system is fully productive. The MUSIC operating system is in limbo because the subcommittee has no consensus from the University community that MUSIC can be deinstalled in favor of CMS. Since MUSIC's future is in doubt, not much has been done to develop it during this time. Baczewski stated that development of CMS could move forward with some funding adjustments. One concrete proposal would be allocate some money for training of faculty and staff and to have someone available to answer questions about the conversion and about the CMS operating system. Baczewski requested an endorsement of the concept of conversion to CMS totally, and presented the following proposals:

- ① Announce the withdrawal of the MUSIC/SP operating system (suggested date - September 1, 1993);
- ② Commitment to fund at least one part-time CMS trainer for the duration of the transition period (1 yr);
- ③ Consider the addition of an academic CMS programmer;
- ④ Consider the purchase of VM Center software package.

A motion was made and passed for implementation of the MUSIC to CMS conversion project as presented in Philip Baczewski's proposal.

Bill Buntain distributed a document outlining Novell Netware direction issues and suggested that this issue be given to an IRC subcommittee for study. It was explained that recent developments in the contractual agreement between UNT and Novell will have serious budgetary implications for the future. Discussion followed. It was agreed to ask the Task Force on Communications Networks to study these issues and report back to the IRC at its next meeting on May 7, 1992. Buntain suggested adding Arne Almquist to the task force to represent the interests of both the library and the Network Managers' Group. He also suggested adding Dave Barker or his designee as a TCOM representative on the task force. Both suggestions were approved by the Council.

Paul Schlieve announced that the Electronic Mail Task Force will be meeting next week to set up test systems of the various E-mail packages being considered. If anyone wishes to participate in the testing, which will be in Matthews Hall 322, 1:00 p.m., Tuesday, April 28, they may do so by requesting an ID from Schlieve.

Ray Vondran presented a final revision of the IRC Charge which had been prepared by the Strategic Planning Committee. A motion was passed to accept the Charge as written, and it will now be delivered to the IRC Steering Committee.

Sue Pierce presented a new list of currently active UNT committees which are dealing with computing issues. The list will be published in *Benchmarks* as it is, but the De Facto Standards Committee was asked by Chairman Vondran to enlarge the list to include the charge given to each committee.

The composition of the IRC will be considered in meetings of the SPC this summer. In addition, the composition of standing committees (one for academic

General Information

computing and one for administrative computing) will be considered after the late summer arrival of the new Sr. Director of Academic Computing.

Chairman Vondran reported that the issue of additional space for the Microcomputer Maintenance Shop was again brought before the IRC Steering Committee, and the Steering Committee assured him that they are working on it. The Voice Mail resolution was discussed, as well as the status of the General Access Labs. It was pointed out that the new Adaptive Lab was mentioned in an article in a CAUSE publication recently. There was also discussion of the \$600,000 needed to fund the building wiring project. Approval was given to put a request for those funds into the Computing Center's central budget request, as well as a request for a support staff person. Richard Harris stated that it would be mid-May before he would be made aware of the outcome of these requests. Harris stated that he believes that the IRC Steering Committee members really understand all of the issues involved in the internal building wiring project, but they have a hard time putting a million dollars all at once.

Coy Hoggard reported that the new IBM mainframe as well as the HDS Cartridge Tape system have met the evaluation criteria and have been accepted by UNT. In addition, the new Voice Response system from Touch Talk, which supports teleregistration and FAVORS, has met its evaluation criteria. The old GTE system is no longer being used. He also reported that the SNA gateway upgrade order has been processed and is expected to be finalized by April 30. Hoggard reported that VP. Diebel and Mike Ferguson of TCOM were talking about the financial future of their two agencies over the next few years and warned that the picture looks bleak; they urged that both institutions continue to use technology to leverage their university staff. A joint TCOM/UNT committee has been formed, chaired by Ginny

Anderson, to study increase in workflow automation.

Richard Harris reported that Rogers Redding and the Instructional Technology Task Force is putting their final report together; one recommendation is that the IRC establish a standing Instructional Technology Committee. The Task Force's report will be forwarded to the Provost following their next meeting.

Cengiz Capan presented the minutes of the April 7 GALC meeting, pointing out that the minutes report: the numbers of computers in each General Access Lab; a savings of about \$48,000 from the Microcomputer Maintenance

Shop budget, as well as \$31,000 left in a contingency fund. GALC plans to make a recommendation to the Provost as to how those savings should be used. The committee also approved the establishment of a budget line item for the Adaptive Lab.

The IRC meetings for the rest of this fiscal year will be as follows:

Thursday, May 7 - 2:00-4:00 p.m.,
Admin. Bd. Room
Tuesday, June 16 - 2:00-4:00 p.m.,
Admin. Bd. Room
Tuesday, July 21 - 2:00-4:00 p.m.,
Admin. Bd. Room

There will not be a meeting in August. ■

Administrative User-ID Issues

By Don Swatloski, Administrative Database/Central Programming Support Team

Note: This article describes actions on the Administrative mainframe. Other systems will not be impacted by the process described here. There are separate processes on each system to handle the situation of excessive unsuccessful log on attempts.

The right to log on to and use computing resources is provided to university employees as needed to do their jobs. It is the responsibility of each user to protect his/her access to these resources to the greatest extent possible. It is assumed that persons not authorized to use the resources may attempt to break into the system by guessing passwords of valid users. Things are set up so that this type of attack on the system will not go unnoticed. Indications from external sources are that this area needs a little tightening up. In an attempt to address this issue we are further changing the access rules for the Administrative systems.

As of May 15, the number of unsuccessful log on attempts permitted for each user is being reduced to 15. When a user exceeds the maximum number, the User-ID will be revoked by RACF. While the revocation is in effect, the user will not be able to logon to the system. This may be an inconvenience to the valid holder of the User-ID, but it is the only sure way to interrupt the attempts and keep the "hacker" from gaining access to the system. (It is assumed that the holder of the User-ID is not at fault, but rather a victim of the revocation.)

At the time of revocation, a notice will be sent to the University Internal Auditor's office. An information copy of the notice will be sent to the Computing Center receptionist, so that intermediate queries about the status of the User-ID can be handled. Additionally, a notice will be sent to the user to inform him/her of the revocation. This may seem a little silly since while unable to log on, the user would not be able to read the mail; however, when the User-ID is turned back on he/she will be informed of the turn off, so that he/she will know of the attempted break-in.

A process is being implemented in an attempt to cause only a minimal impact on the authorized holder of the User-ID. Periodically during the day, User-IDs revoked by RACF will be turned back on. Outside of this process, the auditor's office will have the right to expedite the turn on of a User-ID, if the situation so warrants. ■

Going Somewhere? Read This First

If you're graduating or will be off-campus and away from your computer accounts during the semester break or this summer, **PLEASE** remember to unsubscribe to any electronic mailing lists that you may be on. If you're graduating or otherwise leaving the University, electronic mail and LISTSERV files will continue to arrive until your User-ID is deleted, which could be months later. This puts an unnecessary load on the storage facilities of the computer systems where you receive your mail. It is also extremely irritating to the people who manage the LISTSERVS, who will eventually get return messages stating that mail was undeliverable to you.

So...be nice: If don't plan on reading your electronic mail for a week or more, send a message like the following (you can always resubscribe when you return):

On VM/CMS:

- To *suspend mail* on a specific list:
TELL LISTSERV@location SET
listname NOMAIL
- To sign-off a *specific* list:
TELL LISTSERV SIGNOFF listname
- To sign-off *all* lists:
TELL LISTSERV SIGNOFF *
(NETWIDE)

On VAX/VMS:

Use the same commands as above, substituting the word **SEND** for **TELL**.

To Get Back on the Lists:

Use the **TELL** or **SEND** command, as illustrated above, with the command **SUBSCRIBE listname your_name**. **Note:** You will need to do this for each individual list you want to subscribe to.

If you suspended your mail, send the same message you sent before, but substitute the word **MAIL** for **NOMAIL**.■

The Network Connection

By Dr. Philip Baczewski, Acting Director of Academic Computing,
BITNET INFOREP (BITNET: AC12@UNTVM1)

This column is a continuing feature of Benchmarks intended to present news and information on various aspects of wide area networks.

Finding Information Available Via Wide Area Networks

Increasing amounts of information are being generated and are being made available electronically, and BITNET and the Internet are among the resources that have encouraged this trend. Once you are aware of the number and variety of mailing lists and discussion lists, you realize that quite a bit of electronically based information is potentially accessible. Now, if only you knew where to start looking. In the traditional approach to bibliographic research, you often start with an authoritative source (usually an index or catalog) and follow a chain of references until you find (or don't find) the item of information you require. While many people are working toward the day when all or most electronic information retrieval can be automated, finding electronic information often requires starting with one source and following a chain of references. Fortunately, there are a number of network resources which make the task easier.

Most information exchange on BITNET revolves around installations of LISTSERV software. LISTSERV not only provides automated mail exchange, but also serves as a file server as well. LISTSERV installations usually maintain files related to LISTSERV and BITNET use, but two other classes of files are often maintained as well: mailing list archives are often available and mailing list-related documents or software collections are sometimes maintained. When you are seeking information on a particular topic, you can subscribe to a mailing list and monitor postings or post a direct question yourself, but often your question may have already been addressed in previous mailing list exchanges or postings. Archives of the list, if they are maintained, may contain the information you need. Likewise, generally useful information on a particular topic is often compiled on-line and made available for distribution via LISTSERV.

The first step in searching for such information is finding an applicable mailing list. Last month's "Network Connection" column talked at length about mailing lists and how to find your topic of interest.¹ Searching the available lists of lists discussed in that article is one method. A faster, but perhaps less comprehensive, method is also available. Sending the command **LIST GLOBAL** to any LISTSERV returns a large list of known mailing lists. This command will also accept an additional parameter, any string of characters that you wish, and return only those lists that contain a match on the string you specified. To utilize this feature, you could send the command **LIST GLOBAL string** to the closest LISTSERV. A file containing mailing list entries containing the string you specified will be sent to you. At this point, you could check for archives or files by sending the **INDEX** command to the LISTSERV where a

¹ Baczewski, Philip. "The Network Connection: Electronic Discussion Lists and the Scholar," *Benchmarks* (March/April, 1992, Vol. 13 No. 3 pp. 8-9)

mailing list is maintained. The INDEX command will return a file named **LISTSERV FILELIST** which will usually list the specific file lists maintained at that site, organized by topic. For more information about using the file server aspect of **LISTSERV**, see the document "An Introduction to BITNET," available at the Computing Center offices (ISB 119).

On the Internet side of things, discussion groups are made more accessible through the use of news reader programs like **ANUNews** on the **VAX** or **nn** on the **Solbourne**. These programs allow you to quickly search the news hierarchies for topics of interest. Finding archives is potentially harder, given the diversity of sources for such information. Fortunately, **archie**, a program previously mentioned in this column, provides assistance in searching for Internet archives.² **Archie** not only provides a reference to the location of discussion group archives, but is more commonly used to find public domain and shareware software that has been made available to the Internet community. **Archie** is currently available on the **VAX** and **Solbourne** systems. To use it you simply type **archie string** and **archie** will return Internet addresses and directory locations for all items which match the string you specified.

The above does not exhaust the methodology for searching the networks for information, however, it is intended to illustrate how the wide area networks can be used as information resources. A number of new software technologies are currently being developed to make accessing information more natural and automatic. A network protocol, named **Z39.50**, has been developed to support such application development. You may have seen previous

Please see **WAN** on page 21.

² Baczewski, Philip. "The Network Connection: Getting Started on the Internet," *Benchmarks* (November/December, 1991, Vol. 12 No. 9 pp. 4-6)

List of the Month

Each month we will highlight one BITNET, Internet, or USENET Special Interest Group (SIG) mailing list. This month's list...

This month's list is again two for the price of one (yea!). The lists below may interest those involved in applying new technologies to the process of education.

IPCT-L@GUVM

The Interpersonal Computing and Technology Discussion List is a moderated list that has really taken off. Formed the first part of this year, it already had 625 subscribers from at least 22 different countries after only four weeks. The aim of **IPCT-L** is to bring together people who want to facilitate learning through the use of networks and other technology. People from such areas as educational psychology, distance education, instructional design and development, telecommunications, computer-mediated communications, and sociology frequent the list.

BITNET: **LISTSERV@GUVM**

List Owner:

Zane Berge (BITNET) **BERGE@GUA.VX.BITNET**

NEWEDU-L@USCVM

The New Paradigms in Education List Server is dedicated to experimenting with and exploring the way we educate. Subscribers explore the new paradigms in education and how they can be implemented. For example:

- How is technology changing the way we view education?
- What effects will cooperative/collaborative strategies have on teaching and learning?
- Does the so-called "information age" change the way we view our responsibilities as educators?

BITNET: **LISTSERV@USCVM**

Internet: **LISTSERV@vm.usc.edu**

Moderators: Greg Swan and Paul Privateer (Internet) **NPAD-MIN@mc.maricopa.edu**

*To subscribe to either of these lists, send the message **SUB listname yourname** to **LISTSERV@nodename** where **nodename** is the node that corresponds to the list to which you are subscribing. ■*

WAN continued from page 20.

references to systems like WAIS (Wide Area Information Servers) and Gopher (implemented at many universities as a campus-wide information service), both of which use Z39.50 as their basis.³ Both systems currently perform wide area operations only on the Internet, and any information stored on BITNET LISTSERVs will probably be inaccessible via these methods. It is possible, however, that one day all LISTSERVs will operate on the Internet, allowing their information to be more accessible to automated searching methods. Until that day, however, the old "manual" process can still yield valuable information

³ See Barron, Billy. "Wide Area Information Servers on the Internet," *Benchmarks* (October, 1991 Vol. 12 No. 8 p. 5). ■

IMSL Manuals Available in the Science Library

A set of IMSL manuals has been placed on reserve in the Science Library (ISB). They are available from the Reserve Desk and are reserved under the name "Billy Barron." You must ask for each manual by name. IMSL is the author of all the manuals. They can be checked out for 24 hours at a time.

The following manuals are available:

- STAT/LIBRARY
- MATH/LIBRARY
- MATH/LIBRARY Special Functions ■

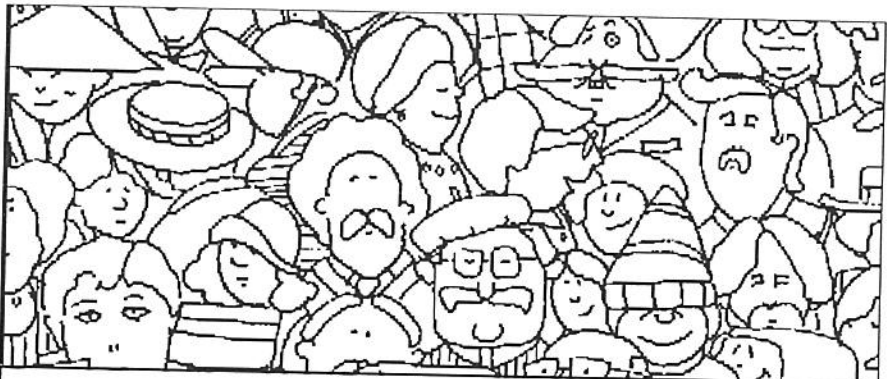
Computing Center Staff Activities

Academic Computing Services

Billy Barron, VAX/UNIX Systems Manager, is continuing his publishing relationship with *Matrix News*. His article, "Tunneling Through the Internet With Gopher" appeared in the February, 1992 issue (Vol. 2, No. 2). Barron also recently reviewed "Zen and the Art of the Internet: A Beginners Guide to the Internet" by Brendan P. Kehoe for *The Public-Access Computer Review* (1992, vol. 3 no.1).

Sumangala Bhattacharya, ISB 110 General Access Lab Monitor, was a winner in the Master's Division of the 1992 University Writing Awards. Her paper was entitled "Education in the *Taming of the Shrew*." Sumangala is a graduate student in the English Department.

Panu Sittiwong, ACS Research and Statistical Support Manager, attended the SAS User's Group International meeting (SUGI 17) in Honolulu, Hawaii April 12-15, 1992. In addition to attending meetings, he coordinated two hands-on workshops: "Exercising the Capability of SAS Software Under OS/2" and "SAS and the Art of Interactive Data Analysis." ■



BENCHMARKS FORUM

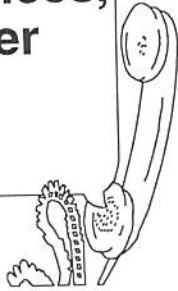
BENCHMARKS FORUM is intended to serve as a vehicle for answering questions that may be of general interest to the user community. If you have a question, please send electronic mail to the *Benchmarks* editor (AS04@UNTVMI) or write it down and drop it by the Computing Center. We will try to answer it in the next issue.

Question: The March/April "Network Connection" referred to files on the CMS D disk. How do I get to them?

Answer: After logging on to CMS you can list files on the D disk by issuing the command: `filel * * D`

At this point, you can BROWSE, XEDIT or whatever else you would normally do with your own CMS files. ■

Calls For Papers, Conferences, And Other Items of Interest



We have received the following "calls" and announcements from various organizations.

Call for Papers, Proposals

- **Application of Advanced Information Technologies for Management of Natural Resources, June 17-19, 1993, Spokane Convention Center, Spokane, Washington** — Proposals are being solicited by the newly formed Information and Electrical Technologies Division of the American Society of Agricultural Engineers (ASAE) for this conference. Sub-

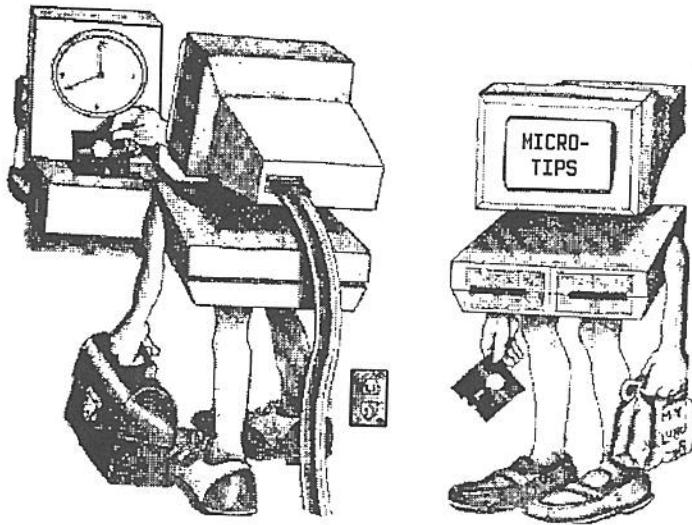
mit a proposal by **May 29, 1992** on such topics as: geographic information systems, spatial simulation, remote sensing, image processing, public and private data archives, multimedia/hypermedia, neural networks, knowledge-based systems, public networks and news groups. For more information, contact: A. Dale Whittaker, Texas A&M University, Department of Agricultural Engineering, College Station, TX 77843-2121 Phone: 409-845-8379 Fax: 409-847-8828 Internet: dale@diamond.tamu.edu

- **The Tenth International Conference on Technology and Education (ICTE '92), March 21-24, 1993, MIT, Cambridge, Massachusetts** — General theme of this conference is rethinking the role of computers (and computational media) in education. Contributions in the form of case studies, theoretical analyses, visions of the future, activist platforms or some combination thereof will be accepted on the following general topics: the variety of uses of technology in learning; the politics of computer use; the theories behind the technology; teachers and technology; technology and curriculum; technology and the culture of the classroom; technology, diversity and pluralistic visions of society; educational technology in a global perspective; visions of the future; lobbying for educational change; and the role of technology in the home. Deadline for proposals is **May 15, 1992**. More information can be obtained from Michael Thomas, Professor and Director or Cheri Chase, Conference Coordinator, Continuing Education Programs, College of Education, The University of Texas at Austin, P.O. Box AA, Austin Texas, 78713 Internet: ict@ccwf.cc.utexas.edu
- **International Conference on Mathematical Linguistics (ICML '93), April 4-7, 1993, Barcelona, Spain** — ICML is an open forum for the presentation and discussion of current research on mathematical models of natural language. The language of the conference is English. Deadline for submission of abstracts is **October 31, 1992**. For further information, contact: Carlos Mart-n Vide, Universitat de Barcelona, Facultat de Filologia, Secci de Linguistica, Gran Via de les Corts Catalanes, 585, 08007 Barcelona, Spain BITNET: d1fcmv0@eboub011

Workshops and Conferences

- **The Learning Technologies Program (LPT), June 14-17, July 26-29, 1992, Cornell University, Ithaca, New York** — LPT is a series of workshops sponsored by Cornell and Apple Computer, Inc. The workshops are designed to increase the number of faculty and staff who can use and integrate learning technologies into the curriculum. For more information about LPT contact: The Learning Technologies Program, CIT 220 CCC Garden Avenue, Cornell University, Ithaca, NY 14853 Phone: 607-255-3329 Fax: 607-254-5222 Internet: LPT@cornell.edu

- **The Seventh International Conference on Computing and Philosophy (CAP), August 14-16, 1992, University of Central Florida (UCF), Orlando, Florida** — This conference is sponsored by the Committee on Computer Use in Philosophy of the American Philosophical Association, the UCF Departments of Philosophy and Computer Science, and the journal *Philosophy and Computing*. For more information, contact: Don Jones, Department of Philosophy, UCF, Orlando, Florida. Phone: 407-823-2273 BITNET: asdhifaa@ucf1vm
- **Problem Solving Across the Curriculum: A Conference for Teaching and Learning Innovations, June 18-20, 1992, Wells College, Aurora, New York** — 33 faculty from 24 colleges and universities will present papers on classroom innovations in such areas as collaborative learning, cooperative learning and writing, software tools to assist writing instruction, computers in the classroom, creative uses of computer technology in education, new opportunities for higher education, and introducing problem solving into core coursework. Ninety-minute workshops will also be offered on the design and implementation of problem solving curricula. For more information, contact: Sharon Gallagher, Director - SUNY Training Center, 750 East Adams St., CWB 343, Syracuse, NY 13210, Phone: 315-464-4078 Fax: 315-464-7303 BITNET: train@snybufva
- **European Summer School in Logic, Language and Information, August 17-28, 1992, University of Essex, UK** — Courses cover a variety of topics within: logic, computation, language, logic & computation, computation & language, and language & logic. Contact European Summer School LL1, Phone: +44-206-2088 Internet: folli@essex.ac.uk for more information.■



*This column is intended to serve as a forum for sharing useful tips on making more productive use of microcomputers. If you have a tip that you feel may be of use to campus users, submit it to the **Benchmarks** Editor for possible inclusion in a future issue.*

What if Your PC is Stolen?

By Kyle Capps, Microcomputer Application Support Manager (Internet: Capps@ccl.unt.edu)

Recently, the FBI and local law enforcement officials cracked a burglary ring in Carrollton, TX that was fencing stolen PCs. Over \$600,000 worth of PCs were stolen from the Dallas/Ft. Worth area and resold by the Carrollton computer dealer as used computers.

Authorities were alerted to the scam when a customer contacted the original owner of the PC after noticing a name and phone number on the hard disk of his newly purchased "used PC." It seems that the computer dealer did not bother to reformat the hard disk on the stolen PCs and the Carrollton police department confiscated \$200,000 worth of stolen PCs with the hard disks intact on most of the machines. Carrollton police are trying to return the equipment to the original owners and anyone may call the Carrollton police to inquire if their stolen PC is among this group of PCs.

To safeguard your PC, it is recommended that you record all your system serial numbers (PC chassis, monitor, hard drive, etc.) so that the machine can be tracked. In addition, you can create a small text file on the hard disk called OWNER.FIL and the contents of the file would be your name, address, and phone number. After creating the text file, type `ATTRIB +R +H C:\OWNER.FIL` so that the file will be read only and hidden. ■



Virus Update

Compiled by Claudia Lynch, *Benchmarks*
Editor (BITNET: AS04@UNTVM1)

Virus Info

- A series of informative articles on protecting your PC from viruses is available via anonymous ftp from cert.org (192.88.209.5) in the directory pub/virus-1/docs/slade.cvp. articles
- Virus-L Frequently Asked Questions (FAQs), complete with answers, is available via anonymous ftp from urvax.urich.edu in the directory msdos.antivirus The file name is VIRUS-L.ZIP, which should, as with all zip files, be downloaded in binary mode.
- The anti-viral archives are the "official" archives of VIRUS-L/comp.virus. They contain the most recent news and programs for dealing with the virus problem. Sites exist for Amiga, Apple II, Atari ST, IBM PC, Macintosh and UNIX computers. Some sites also contain research papers and reports of general interest. The latest listing is in VIRUS-L Digest V5 #81.

New MAC Virus

- **CODE 252** is a new virus that is designed to trigger if an infected application is run or an infected system is started up between June 6 and December 31 of any year. Between January 6 and December 30, the virus simply spreads from applications to system files, and then on to other application files. When triggered, the virus displays a message stating that your files are being erased.

No files or directories are actually deleted, but a worried user could turn off or restart their MAC which might corrupt the disk. Disinfectant 2.8 detects this virus. ■

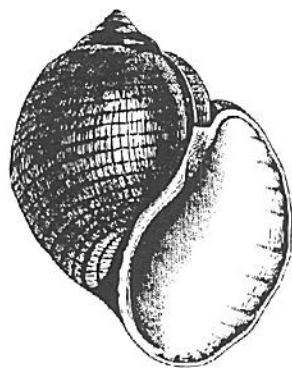
VAXCLUSTER USAGE STATISTICS

March Top Ten Programs: CPU Time Used

Program	Description	CPU Time	Percent of Total
1. User programs	Compiled Programs	8 02:20:22.39	36.7
2. LISP	Lisp Interpreter	3 06:03:55.44	14.8
3. MOPAC	Quantum Mechanics	2 19:53:58.35	12.8
4. NEWS	ANU News Utility	2 07:31:52.70	10.5
5. DEFRAG	Disk Optimizer	1 22:22:17.62	8.8
6. MAIL_SERVER	VMS Mail Server	0 10:00:36.41	1.9
7. GAUSSIAN	Molecular Modelling	0 09:54:28.38	1.9
8. LOGINOUT	User Login	0 07:51:09.41	1.5
9. MAIL	VMS Mail Utility	0 07:36:57.86	1.4
10. BACKUP	Disk Backups	0 07:30:42.61	1.4
Total		22 01:12:35.48	

March Top Ten Programs: Frequency of Runs

Program	Description	Number of Runs	Percent of Total
1. SET	VMS Utility	135839	25.2
2. LOGINOUT	User login	122318	22.6
3. DIRECTORY	VMS Utility	49712	9.2
4. DELETE	VMS Utility	45924	8.5
5. User programs	Compiled Programs	29678	5.5
6. MAIL_SERVER	VMS Mail Server	19598	3.6
7. SYSLOGIN	User Login	17922	3.3
8. MAIL	VMS Mail Utility	14468	2.7
9. TYPE	VMS Utility	9866	1.8
10. SEND	BITNET Message Utility	8216	1.5
Total		540069	



The UNIX Shell

By Marc St.-Gil, UNIX Systems
Programmer (mstgil@sol.acs.unt.edu)

I/O Redirection in the Bourne Shell: sh

Hello! And welcome back to The UNIX Shell. In this month's column I am going to discuss input/output (I/O) redirection in the Bourne shell, sh, as a continuation from last month. As you may recall from last month, I/O redirection is most often used to capture the output of a UNIX command that would normally print to your terminal screen. This can be very useful with programs that produce large quantities of output or when you want to save a copy of the

output for later perusal or perhaps to print. Most computer users have used a *pager* to scan a large file. A *pager* is a program that breaks up a file into screen sized chunks as it prints out the file, allowing you to pause between pages. In UNIX this program is often named "more". If, for example, you had a large text file (named *myfile*) that you wanted to view on your terminal screen, you could use the command **cat myfile** to view that file. Using the **cat** command however will simply output the file to your terminal screen as fast as UNIX can go. This is not often very useful since UNIX can generally cat faster than you can read. A more practical approach would be to use the command **more myfile**.

There are several different symbols to represent I/O redirection to a shell and they differ not only in the function represented, but also for different shells. For the duration of this follow-up column I will make examples showing Bourne shell syntax. For C shell examples, see the UNIX Shell column in the previous issue of *Benchmarks*.

Let's first consider the case where we want to capture the output of some program. For our first example, let's capture the output from the UNIX date command. The following command will put the current date and time information into a file called *curdate*:

```
$ date > curdate
$ cat curdate
Mon Mar 27 11:48:21 CDT 1992
```

This example used the greater-than symbol (>) to indicate to the shell that output from the preceding command, date, should write output to a new file, curdate. This should look familiar as this is identical to the way C shell operates when its noclobber variable is not set. There is no Bourne shell equivalent of the C shell noclobber variable so there is no protection from overwriting an existing file. If the file exists, its contents are replaced by the new output, otherwise a new file is created for the output. This happens regardless of whether any output is

generated by the program or not. See the example below:

```
$ cat curdate
Mon Mar 27 11:48:21 CDT 1992
$ date > curdate
$ cat curdate
Mon Mar 27 12:08:16 CDT 1992
$ cat /dev/null
$ cat /dev/null > curdate
$ cat curdate
$
```

As you can see in the above example, we first overwrote the contents of our curdate file with the new output from the date command and then we overwrote the contents again with cat command even though the command itself generated no output. This is because the shell, Bourne or C alike, creates or overwrites the file in order to redirect output to it. Whether the program generates output or not, the file has been created or truncated in advance by the shell so the contents are still lost.

Redirecting the output of a command does not affect the error messages that command may generate. This is identical to the way the C shell operates. Redirecting error messages is also possible, by adding a numeral 2, immediately before the greater-than (>) to make a 2> symbol. Note that, unlike the C shell, this will now only redirect the error messages, and the normal, or standard, output goes to your screen. Now we see that I/O redirection is one of the most basic differences between the Bourne shell and the C shell. You can still redirect both output and error messages, but it takes two output redirection symbols in combination to make it happen as you can see below:

```
$ date -z> curdate 2> date_errors
$ cat curdate
usage: date [-a sss.fff] [-u]
[+format] [yyymmddhhmm[.ss]]
$ cat date_errors
date: illegal option - z
```

Note that while the existing file, curdate, was overwritten, the new file, date_errs, was created. The significance of the 2 is that 2 is the value of the file descriptor for the standard error stream. You may have heard of the terms standard input (STDIN), standard output (STDOUT), and standard

error (STDERR). These are programmer's names for "where input to the program comes from" (STDIN), "where output from the program should go" (STDOUT), and "where error messages go" (STDERR). By default, STDIN comes from your terminal's keyboard and both STDOUT and STDERR go to your terminal's screen. You have probably noticed that twice now I have mentioned these three concepts in a particular order. That's because in UNIX most programs inherit these 3 file descriptors (FDs) from their parents. The parent in this case is the Bourne shell into which you are typing commands. Now since computers like to start counting with the numeral 0 instead of 1, the STDIN FD is number 0, the STDOUT FD is number 1, and

the STDERR FD is number 2. Thus you can now correctly infer that > is actually shorthand for >1. Now if we wanted to send both STDOUT and STDERR to the same place, as in the C shell & symbol, it is done as follows:

```
$ date -z > curdate 2>&1
$ cat curdate
date: illegal option -z
usage: date [-a sss.fff] [-u] [+format] [yyymmddhhmm[.ss]]
```

Note that in this example both the STDOUT, the line that begins with "usage:" and the STDERR, the line that begins with "date:" have been sent to the file curdate. What we have done here is to say:

```
$ date > curdate 2>&1
```

SOLBOURNE USAGE STATISTICS

March Top Ten Programs: CPU Time Used

Program	Description	CPU Minutes	Percent of Total
1. g90	Gaussian 90	24547.0	24.6
2. sas	Statistical Package	17630.8	17.7
3. crack	User Program	12976.4	13.0
4. hydquant	User Program	5914.4	5.9
5. yang	User Program	4084.6	4.1
6. auto2	User Program	3420.5	3.4
7. a.out	User Program	2743.9	2.8
8. yang101	User Program	2379.4	2.4
9. yang1031	User Program	1884.2	1.9
10. yang 103g	User Program	1884.2	1.9
Total		99744.8	

March Top Ten Programs: Run Time Used

Program	Description	Number of Runs	Percent of Total
1. snmpget	User Program	229619	25.4
2. sh	Bourne Shell	82442	9.1
3. is_able	Permissions Checker	39884	4.4
4. csh	C Shell	34702	3.8
5. sendmai	Mailer Program	27211	3.0
6. ls	Directory	24297	2.7
7. awk	Text Processing Lang.	19766	2.2
8. rm	Delete File	17457	1.9
9. echo	Print	16136	1.8
10. test	Comparison	15997	1.8
Total		903737	

sends STDOUT to a file named curdate and create it if necessary

```
$ date > curdate 2>&1
```

sends STDERR to the same place as STDOUT (referenced by &1)

This means that STDERR would go to the file curdate because that's where the STDOUT messages were headed when the redirection occurred. And if we said:

```
$ date 2>&1 > curdate
```

the shell would send STDERR to your screen (which was the default anyway) and send STDOUT to the file curdate. Note that STDERR doesn't get redirected to curdate, because STDOUT wasn't redirected to curdate when the shell redirected STDERR.

For our next example, let's assume that we are working on a project and wish to keep track of the time spent on it. We could keep track of time spent by redirecting the output of the date command to a file. For example, we could create a file called *myfile*. Then whenever we started working on the project we could send the output of a date command to our file and whenever we finish we could send the output of a date command to our file again. The new thing in this example is that we don't want to overwrite the current contents of the file because then we would lose our previous times for the project. What we need now is a way to append command output. Again, this works just like the C shell syntax we learned last time. The following command will append the output of the UNIX date command to our file *myfile*:

```
$ cat myfile
Fri Mar 24 11:12:51 CDT 1992
Mon Mar 27 11:48:21 CDT 1992
$ date >> myfile
$ cat myfile
Fri Mar 24 11:12:51 CDT 1992
Mon Mar 27 11:48:21 CDT 1992
Tue Mar 28 09:34:12 CDT 1992
```

This example used two greater-than symbols (>>) to indicate to the shell that output from the preceding command, date, should be appended to the

contents of the file named after the symbol, myfile. Again, if we want to send error messages to the file as well, we just add a 2>&1 after redirecting the output to myfile and any error messages generated by the command will also be appended to myfile. If the file didn't previously exist the Bourne shell would simply create it for you. You can also append error messages to an error message file while appending output to a different file. This is another one of the things the C shell cannot easily do. See the examples below:

```
$ cat outfile
Tue Mar 28 09:34:12 CDT 1992
$ cat errfile
```

Note that errfile doesn't exist.

```
cat: errfile: No such file or directory
$ date >> outfile 2>> errfile
$ cat outfile
Tue Mar 28 09:34:12 CDT 1992
Tue Mar 28 09:34:23 CDT 1992
$ cat errfile
```

Note that errfile now exists, but is empty.

```
$ date -z >> outfile 2>> errfile
$ cat outfile
Tue Mar 28 09:34:12 CDT 1992
Tue Mar 28 09:34:23 CDT 1992
usage: date [-a sss.fff] [-u] [+format] [yymmddhhmm[.ss]]
$ cat errfile
date: illegal option -z
$ date -z >> outfile 2>&1
$ cat outfile
Tue Mar 28 09:34:12 CDT 1992
Tue Mar 28 09:34:23 CDT 1992
usage: date [-a sss.fff] [-u] [+format] [yymmddhhmm[.ss]]
date: illegal option -z
usage: date [-a sss.fff] [-u] [+format] [yymmddhhmm[.ss]]
$ cat errfile
date: illegal option -z
```

For the next example, let us assume that we want to see a sorted list of all the users currently on the system:

```
$ who
mstgil   tty01   Mar 27 14:56
darren   tty0    Mar 27 15:01   (anto2.acs.unt.edu)
albert   tty01   Mar 27 12:01   (morticia.cnns.un)
darren   tty02   Mar 27 15:12   (anto2.acs.unt.edu)
$ who | sort
albert   tty01   Mar 27 12:01   (morticia.cnns.un)
darren   tty0    Mar 27 15:01   (anto2.acs.unt.edu)
darren   tty02   Mar 27 15:12   (anto2.acs.unt.edu)
mstgil   tty01   Mar 27 14:56
```

This example used the vertical-bar symbol (|) commonly referred to as a *pipe*. This form of I/O redirection is used to connect the output of one program to the input of another program. Once more, piping STDERR along with STDOUT is done differently from the C shell approach. Preceding the pipe symbol with the 2>&1 symbol has the effect of sending any error messages along with the output just like using |& in the C shell. For example:

```
$ date -z | cat /dev/null
date: illegal option -z
```

Note that STDERR from the date command bypassed the cat command.


```
$ date -z 2>&1 | cat > /dev/null
$ date -z 2>&1 | sort
date: illegal option -z
usage: date [-a sss.fff] [-u] [+format] [yymmddhhmm[.ss]]
$ date -z 2>&1 | sort -r
```

The sort -r command sorts in reverse order.

```
usage: date [-a sss.fff] [-u] [+format] [yymmddhhmm[.ss]]
date: illegal option -z
```

A sequence of commands can be strung together using pipes and redirects. For example, if we wanted to save the output of the previous pipeline to a file, *myfile*:

```
$ who | sort > myfile
$ cat myfile
albert  ttyt1  Mar 27 12:01  (morticia.cnns.un)
darren  ttyt0  Mar 27 15:01  (anto2.acs.unt.edu)
darren  ttyt2  Mar 27 15:12  (anto2.acs.unt.edu)
mstgil  tty01  Mar 27 14:56
```

For our last example, let us assume that we want to duplicate the “who | sort myfile” pipeline in the example above, but we don’t want to use the pipe redirect.

```
$ who > my.who.file
$ sort < my.who.file > myfile
$ cat myfile
albert  ttyt1  Mar 27 12:01  (morticia.cnns.un)
darren  ttyt0  Mar 27 15:01  (anto2.acs.unt.edu)
darren  ttyt2  Mar 27 15:12  (anto2.acs.unt.edu)
mstgil  tty01  Mar 27 14:56
```

As you can see in the command `sort < my.who.file > myfile` we have used a new redirect symbol. This is the less-than symbol (<) which is used to indicate to the shell that input for the preceding command, sort, should be taken from the following file, “my.who.file”. This example also illustrated using both the input and output redirects to affect a single command.

Stay tuned next month when we’ll cover more I/O redirection techniques and how they can be used in command aliases and shell scripts. ■

VAX/UNIX NEWS

UNIX News

- **NetFind** — Just one more tool to use when looking for that hard to find E-mail address. NetFind is a tool for finding Internet addresses. To use it, type a command of the format: **netfind name key key**

The *name* field should be either first, last, or log in name. The *key* fields describe where the person works (name of institution, city, state, country, or type of institution). For example:

netfind lippke university texas dallas

NetFind can be slow and does have a few problems, but at times is extremely useful.

For more information, type **man netfind**. If you want to see how to correct database errors that you see, type **man dblookup**.

- **New NCD X Terminals** — The ACS General Access Lab in ISB 110 has just installed three NCD color X Terminals. These terminals provide additional graphics functionality to applications such as SAS and Mathematica on the Solbourne. Other applications can also take advantage of the graphical interface.

The terminals will be available to the general student population at the start of the first summer term. Because of the small number of terminals, use of games and use of the terminals as ASCII terminals is prohibited. For information on getting individual or class access to the terminals, please speak with Eric Lipscomb, ACS Lab Manager (565-2324).

- **unzip upgraded to version 4.2** — unzip has been upgraded to version 4.2. zip will be upgraded to version 1.6 as soon as it is moved out of beta testing.
- **Updated policy on cpu-intensive processes** — The following types of programs are considered cpu-intensive:
 - All user compiled programs that run for more than 10 minutes of CPU time.
 - All Mathematica runs of any sort.
 - All SAS runs of any sort.

If you do not run any of these types of programs, you may safely ignore the rest of this message. All users are limited to 2 cpu-intensive (see above for definition) jobs at a time. The operators are authorized to stop or kill, at their discretion, any additional jobs.

If you have a cpu-intensive job that is non-interactive (i.e., math - batchinput, commandlines ending in &, etc.) you **must** “nice” your job with a value of 10. Nicing your job forces it to more easily relinquish control of the cpu, which means that

VAX/UNIX SYSTEMS

interactive users will still get reasonable response time. Your job will take longer to run this way, but otherwise the other users will not get a fair slice of CPU time.

NOTE: SAS and Mathematica *interactive* runs need not be niced, but they still fall under the 2 cpu-intensive processes per user ruling. Exceptions to this policy must be obtained at least 24 hours in advance and are only available through the Computing Center office during regular office hours.

To correctly nice a job, use one of the following commands:

```
% nice +10 job &                                (csh)
$ nohup /usr/bin/nice -10 job &                  (sh)
```

For example:

```
% nice +10 math -batchinput -batchoutput <inputfile> & outputfile & ■
```

PBS Airs Computer Series

PBS began broadcasting a five part series on the history and impact of computers on April 6. Check local listings for the series, "The Machine that Changed the World." The five programs are as follows:

- ① "Giant Brains"
- ② "Inventing the Future"
- ③ "The Paperback Computer"
- ④ "The Thinking Machine"
- ⑤ "The World at Your Fingertips" ■

MAINFRAME TECHNICAL SERVICES

March Top Ten Programs : Frequency Of Runs

Program	Description	#of Runs	% of Total
1. IEBGENER	IBM Utility	15337	19.7
2. IEWL	Linkage Editor	14327	18.4
3. PGM=*.DD	Compiled Program	13836	17.7
4. IGYCRCTL	VS COBOL2 Compiler	10436	13.4
5. SPCHLCOB	COBOL2 Report Writer	5229	6.7
6. IDCAMS	VSAM Utility	4356	5.6
7. CASMA001	Sort Utility	3763	4.8
8. IEFBR14	IBM Null Utility	3434	4.4
9. SASLPA	SAS Version 5.18	1804	2.3
10. SPSS	SPSS Version 4.0	1440	1.8

March Top Ten Programs: CPU Seconds Used

Program	Description	CPU Seconds	% of Total
1. SASLPA	SAS Version 5.18	119969	50.6
2. PGM=*.DD	Compiled Program	21768	9.2
3. SPSS	SPSS Version 4.0	21726	9.2
4. IGYCRCTL	VS COBOL2 Compiler	17151	7.2
5. SPCHLCOB	COBOL2 Report Writer	16827	7.1
6. COMPLET4	Academic COM-LETE	9022	3.8
7. IEWL	Linkage Editor	7369	3.1
8. SSS4001	Operations Automation	5518	2.3
9. SAS370	SAS Version 6.06	4492	1.9
10. EBGNER	IBM Utility	2160	0.9

MAINFRAME TECHNICAL SERVICES

Mainframe Performance Statistics

Operating Systems Performance Statistics for March

CPU	SYSTEM	Planned Production Hours	Production Hours Achieved	System Uptime
ACAD	VM/XA	720.92	715.58	99.3%
ACAD	MUSIC/SP	698.61	692.72	99.2%
ACAD	MVS/JES2	719.70	712.33	99.0%
ACAD	COMPLETA	718.83	711.24	98.9%
ADMN	MVS/JES2	715.12	708.21	99.0%
ADMN	COMPLETA	300.00	300.00	100.0%
ADMN	ADABASA	692.50	682.87	98.6%

- The ACAD CPU (HDS/8083) achieved 99.9% uptime in March. The HDS/7360 DASD achieved 100% uptime in March. The HDS/7380 DASD achieved 100% uptime in March.
- The old ADMN CPU (HDS/8083) achieved 100% uptime in March. The new ADM CPU (IBM 9121/440 processor) achieved 100% uptime in March. The HDS/7360 DASD achieved 100% uptime in March. The HDS/7380 DASD achieved 100% uptime in March. The IBM 3390 DASD achieved 100% uptime in March. The EMC Solid State Disk achieved 100% uptime in March. ■

Key Causes Of Lost Productivity In March: ACAD CPU

MPU, Tape, and Disk Subsystems (HDS)

- | | |
|--|--------------------|
| 1. Scheduled install of additional 32 meg. of central storage & add 8 channel subsystems on ACAD 8083 MPU. | 20.25 HOURS |
| 2. Component failure in 8083 CPU 0 processor. | <u>1.49</u> |
| TOTAL | 21.74 HOURS |

Miscellaneous

- | | |
|--|---------------------|
| 1. Preparatory maintenance for install of additional 32 meg. of central storage & 8 channel subsystems on ACAD 8083 MPU. | 4.13 HOURS |
| 2. VM/XA systems software maintenance. | 3.90 |
| 3. Restore VM/XA operation after auto-restart. | <u>2.20</u> |
| TOTAL | <u>10.23</u> |
| GRAND TOTAL | 31.97 HOURS |

Key Causes Of Lost Productivity In March: ADMN CPU

MPU, Tape, and Disk Subsystems (HDS)

- | | |
|---|-------------------|
| 1. Scheduled de-install of central storage & 8 channel subsystems on ADMN 8083 MPU. | 6.00 HOURS |
| 2. Researching cause of device failures on the 7420 & 7490 tape drives. | <u>1.88</u> |
| TOTAL | 7.88 HOURS |

Processor and Disk Subsystem (IBM)

- | | |
|--|--------------------|
| 1. Scheduled install of 90121 Model 440 processor & 3390 DASD string.. | 12.70 HOURS |
| 2. Scheduled de-install of HDS 8083 MPU. | <u>7.30</u> |
| TOTAL | 20.00 HOURS |

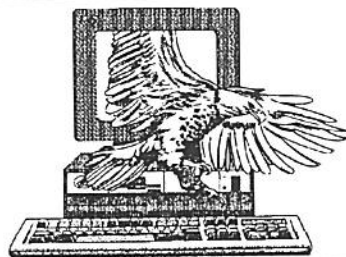
Miscellaneous

- | | |
|--|----------------------|
| 1. MVS/SP systems software maintenance. | 3.53 HOURS |
| 2. Preparatory maintenance for de-install of HDS 8083 MPU & install of IBM 9121/440 processor. | 3.20 |
| 3. Reload of IOCDS to restore device configuration | 1.80 |
| 4. Restore ADABAS operation after MVS/SP failure. | 1.30 |
| 5. Reload of IOCDS to correct device failures on the HDS 7420 and 7490 tape drives. | <u>1.12</u> |
| TOTAL | <u>10.95</u> |
| GRAND TOTAL | 38.83 HOURS ■ |

MAINFRAME TECHNICAL SERVICES

Disk Backup Schedules

SYSTEM	BACKUP	DESCRIPTION
Administrative MVS/SP	Daily	Monday - Friday around 7 p.m. (after COM-LETE is shut down) & on Saturday & Sunday if COM-LETE has been up that day.
	Weekly	Full pack dumps taken each Sunday morning.
	Monthly	Full pack dumps taken on the first day of each month.
Academic MVS/SP	Daily	Monday - Sunday during the early hours of the morning.
	Weekly	Full pack dumps taken each Sunday.
	Monthly	Full volume dumps taken on the first day of each month.
MUSIC/SP	Daily	Wednesday - Monday starting at 4 a.m. and lasting about 30 minutes.
	Weekly	Tuesday mornings at 3 a.m., these last about 2 hours.
	Semester	Once a semester, a permanent backup is taken.
VM/XA	VM Weekly	Early every Wednesday morning.
	CMS mini-disks	Daily backup performed early every morning. Weekly backup every Tuesday starting after Midnight.
	Semester	Once a semester, a permanent backup is taken.
VAXcluster	Daily	Incremental backups are performed Monday - Thursday at 6 p.m. Saturday & Sunday at 5 p.m.
	Weekly	Full backups are performed every Friday beginning at 8 a.m. Generally lasts all day.
	Monthly	A "stand-alone" backup is performed monthly. Dates and times are given in the system log-on message.
	Semester	Once a semester, a permanent backup is taken.
Solbourne	Daily	Incremental backups are performed Sunday - Friday at 2 a.m.
	Weekly	Full backups are performed every Saturday at 3:30 p.m.
	Semester	Once a semester, a permanent backup is taken.



**University
of North
Texas
Computing
Center**

Richard A. Harris, Associate Vice President for Computing
Steve Minnis, Director of Mainframe Technical Services
Dr. Philip Baczewski, Acting Director of Academic Computing,
Benchmarks Associate Editor
Coy Hoggard, Director of Administrative Computing
Bill Buntain, Director of Network and Microcomputer Services
Claudia Lynch, *Benchmarks* Editor
Cynthia Koepp, *Benchmarks* Assistant Editor

CLIP TIP

Anonymous FTP*

FTP (File Transfer Protocol) can be initiated from your PC or from a host. There is a special User-ID for ftp users who don't have a regular User-ID on the host to or from which they wish to transfer files. This User-ID is not available on all hosts. If a host supports this special User-ID, the host is said to support "Anonymous FTP."

You can ftp from one Internet site to another. On the UNT campus, ftp is supported by the VAX, Solbourne, and CMS. You can also use ftp from your PC or Mac in certain situations (contact ACS at 565-2324 if you have questions about this).

To ftp to an "anonymous ftp site," you would type **ftp remote IP Address**. The IP address will look something like: ftp.unt.edu or 129.120.1.1 (this is the anonymous ftp account on Sol). When prompted for a username you would type **anonymous**. When prompted for a password you would type your User-ID (me@unt.edu for example). You can now use the **dir** command to see a directory listing, the **cd** command to change directories, and the **get filename** command to transfer files (remember to type **binary** before transferring binary files). You can type **help** if you have questions about ftp commands.

* The following references were used for this tip. (1) The Academic Computing Services (ACS) document "Using CUTCP Telnet/FTP," pp. 11-12. This document is available from the Computing Center (ISB 119). (2) The article "TCP/IP for VM" from the October 1991 issue of *Benchmarks* (Vol. 12 No. 8 pp. 14-16). ■

Get a Subscription to *Benchmarks*

Benchmarks is a vital link between the UNT Computing Center and the users of our facilities. It is important for all users of the computing facilities to maintain a file of these newsletters because they contain materials which will periodically update existing documents as well as information and suggestions on uses of OS/MVS, MUSIC/SP, the VAXcluster, Solbourne, Microcomputers, and other resources available to UNT students and faculty. To facilitate the dispersal of *Benchmarks*, *****FREE** *** subscriptions are available. To receive yours, send the following information to us either by snail mail (the post office or campus mail), FAX (817) 565-4060, or through electronic mail, to the User-ID AS04 on MUSIC, VMS, SOL, or CMS.

Name: _____

Mailing Address: _____



Academic Computing Services
The Computing Center
NT Box 13495
University of North Texas
Denton, TX 76203
FAX 817-565-4060
